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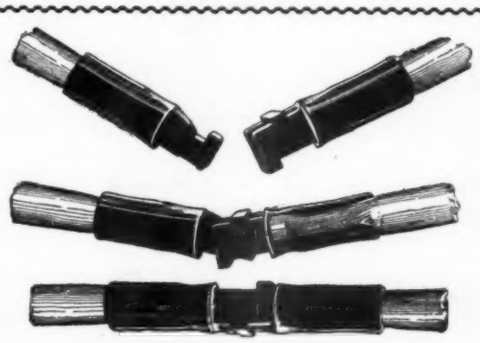

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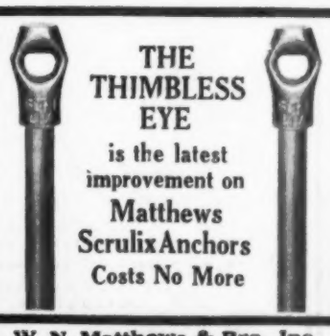

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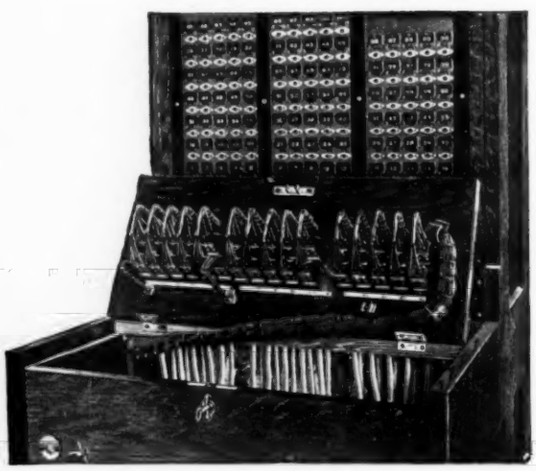

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Telephony.

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CURRENT OPINIONS AND COMMENTS

With four months of the year elapsed, the experts who watch the pulse of general business agree that its improvement is becoming more satisfactory. One Chicago bank, in a four-page review of all lines, says the progress made since March 1 includes all industries, and, what is equally encouraging, that the growth is not merely seasonal but reflects a steady, healthy return to good times.

A report made by one of the telephone manufacturers in the Middle West has special interest. Some time ago this concern predicted that 1922 would see business pick up.

* * * *

"Our prediction so far has not only proved true, but the result has exceeded our expectations," writes this company. "Some increases in agricultural prices have helped the farmer. The strength in the bond market has stimulated new construction work. A great many telephone companies are placing their orders for spring construction material earlier this year than they have in previous years. This is one indication that confidence is again returning.

"Several good-sized switchboard contracts have recently been placed with us, and telephone orders for spring installation are increasing every day. These orders are forerunners of the business revival which will be in evidence next fall, and will continue through 1923."

* * * *

That is a cheerful note which sounds pleasant to the ear. This is the right time for operating companies to buy material and get busy on new construction as well as repair the damage done their lines during the rough weather of the past six months.

Tremendous havoc was done by sleet storms in Michigan, Wisconsin, Minnesota and other states within the last month, as though old Winter had regretted at the last moment being so mildly good-natured most of the season.

* * * *

Sleet storms are costly to telephone companies, but they do make telephone users appreciate service. A report from Fond du Lac, Wis., says: "Probably never before have farmers in this vicinity realized the value of their telephone service, for now with the lines wrecked by the recent sleet storms, the farmers must drive from two to ten miles into town to do errands and transact business which they formerly accomplished over their telephones."

The field secretary of the Fond du Lac County Farm Bureau says it is surprising how the lack of telephone communication retards work on the farms.

"The estimate of loss in time and money to farmers, as a result of being deprived of telephone service, is hard to make, but it is enormous," he states. "One trip of five miles in the present conditions of the roads will sometimes pay for every telephone pole along the highway traveled, figuring time lost, wear and tear and breakage incident to such hazards experienced with buggy or automobile.

"Information on various questions for either business or educational promotion work from our farm bureau office is practically impossible. This in itself means a loss in service which we shall never be able to redeem."

* * * *

The farmer should also remember the value of telephone service when the operating company finds it necessary to ask for a modest increase in rates. Too often he waxes furiously angry when asked to pay 25 cents a month more to enable the service company to earn a decent return, and he even goes to the extreme of organizing a boycott to prevent its collection. That type of farmer is worse medicine to the rural company than even the sleet storm.

* * * *

As anticipated, in its final report the radio telephone conference recommended that radio communication be officially declared a public utility, and that it be placed under the control of the federal government. In order to prevent monopoly, it also urged that "the type of radio apparatus most effective in reducing interference should be made freely available to the public without restriction."

Another important feature of the report is the action of the conference in strongly advising against "point to point" radio communication, or communication between two fixed points, instead of general broadcasting. The conference says such methods of transmission should not

be used when other means are available, for instance, the wire telephone and telegraph. This is significant as indicating that the leading experts who participated in the conference do not expect that radio activities will in any sense supplant wire service as a commercial utility.

* * * *

For some reason the Washington news reports of late have been markedly silent regarding the movement to limit the issue of tax-free securities. Not so long ago there was much favorable discussion of a plan to curtail the flood of this kind of bonds, so that public utilities and general business would have fairer competition in getting needed capital.

The McFadden resolution appeared in Congress providing for such a square deal, and no valid reason was advanced against its adoption. Unfortunately, it seems to have struck a snag.

* * * *

Public service companies are vitally interested in such a measure, for it would lighten their difficulties in securing capital. Men with much money to invest figure closely, and if their net return from government, state or municipal bonds—which are tax free—approximates the rate they would receive on utility investments (which are subject to tax), their money will go into the former. Experience has shown that conclusively.

All utility corporations should unite in urging action at Washington on this important matter. Unless they show active interest, the proposition will continue to sleep in a pigeon-hole.

State and local taxes paid by public utilities are generally conceded by courts and commissions to be an operating expense, and as such should be considered as a factor in the fixing of rates. As to federal taxes, however, there is a wide difference of opinion.

The Mutual Telephone Co., of Honolulu, raised the point before the Hawaii Public Utilities Commission recently, and the commission allowed federal income taxes as an operating expense. A survey of the opinions handed down in the various states is interesting as showing how the question is viewed.

Besides Hawaii, in Wisconsin, South Dakota and Connecticut, the commissions have allowed federal taxes as an operating expense. On the other hand, the commissions of Illinois, Indiana, New Hampshire, New Work, Washington, Pennsylvania, Colorado and District of Columbia have ruled the opposite.

The California and West Virginia commissions make a distinction between the normal federal income tax and the excess profits and other war taxes, allowing the former and disallowing the latter.

In this connection, it is important to remember that the United States Supreme Court, in the New York Consolidated Gas case, in substance upheld this principle that federal taxes are an operating expense.

* * * *

The Hawaii commission ruled that the Mutual Telephone Co. was entitled to earn 9 per cent on the investment, and rejected the contention that federal taxes are not an operating expense, considering that contention a fallacy "in that it results in nothing more than indirectly reducing the net return determined upon as a reasonable return to the utility."

The commission also said: "In other words, if income taxes are disallowed as an expense of operation, the net result is that instead of being allowed the 9 per cent which we have determined upon as a reasonable return in this case of the Mutual Telephone Co., the return allowed to this utility would be 9 per cent less the amount of the income taxes, and in order to bring to the utility a net return of 9 per cent it would be necessary to add to the 9 per cent the proportionable amount of the taxes."

* * * *

In this age taxes have come to be as much of a fixed item of expense as the most common necessities—only they are not fixed, either, for they seem to be ever soaring upward. Legal technicalities aside, however, it would seem that if a utility is allowed a certain percentage of return on its capital, it should have that return clear and above taxes.

So far as investors are concerned it makes little difference to them whether their money goes into labor or taxes. Both are actual expenses to the company.

* * * *

There should be a representative attendance at the meeting of the directors of the United States IndependentTelephone Association, called for May 8. It is the semi-annual meeting and, besides arranging the date for the convention, other important matters will be up for discussion. No member of the board should fail to be present at this conference.

Practical Hints on Phantom Circuits

Principles Underlying Use of Phantom Circuit—Requisites of Satisfactory Repeating Coil—Cable and Loaded Circuits—Practical Applications and Maintenance—Paper Presented at Convention of Illinois Telephone Association

By Prof. R. V. Achatz

The possibility of carrying on more than one telephone conversation over a single circuit without interference between the messages has a peculiar appeal to the imagination. This idea, and the kindred one of using the circuit simultaneously for telephone and telegraph messages, is almost as old as the telephone itself.

Professor Shepardson in his book on "Telephone Apparatus" states that the name "phantom circuit" was applied to a system of simultaneous telegraphy and telephony in 1883 by George Black, a writer in the Electrical World. An English patent for simultaneous telegraphy and telephony was granted to F. Jacobs in 1882. The English inventor proposed to use resistances arranged in a Wheatstone's bridge form to prevent interference between the two signals. An early American method planned the use of repeating coils in the same way as they are used in what is known as the simplex circuit.

The application of the phantom idea to commercial circuits was delayed for many years after its invention because an efficient type of repeating coil had not been developed. It was not until the first years of the present century that a satisfactory phantom coil was developed and even then the cost of the coil was so high that its use was not extensive except by the larger companies.

Since the development of the modern high efficiency coil at more reasonable prices, the application of the phantom circuit has increased rapidly.

It is the practice of the long distance

companies to use the phantom wherever physical circuits of the proper type are available. Local companies are using them more and more on comparatively short toll circuits and in cases where it is desired to obtain a larger number of circuits for a given number of wires used for rural service.

Telephone men are generally well informed as to the principle of the phantom circuit and what is said here in the way of a brief description of its operation is for the purpose of making more clear some of the things that will be said later rather than for the purpose of explaining the manner in which it functions.

The term "phantom" implies something ghostly and mysterious and difficult of comprehension. It suggests a circuit between two terminals without any real physical path for the flow of current. As a matter of fact, the current in a phantom circuit has a path over conductors of real physical material just as truly as the current in an ordinary circuit composed of two wires has a path over conductors of real physical material.

This may be illustrated by a diagram of the simplex circuit, Fig. 1. As far as the metallic telephone circuit on this chart is concerned, its operation differs in no way from that of any metallic circuit into which two repeating coils have been introduced. It is true that the introduction of the repeating coils makes a slight reduction in the transmission efficiency of the circuit but with modern, well-designed coils this reduction is scarcely appreciable even to a skilled observer.

If the path of the current in the grounded circuit is traced, it will be found that it flows through two coils of the winding and then out over the two wires of the line in the same direction. From the two wires it flows through two coils of the repeating coil at the distant

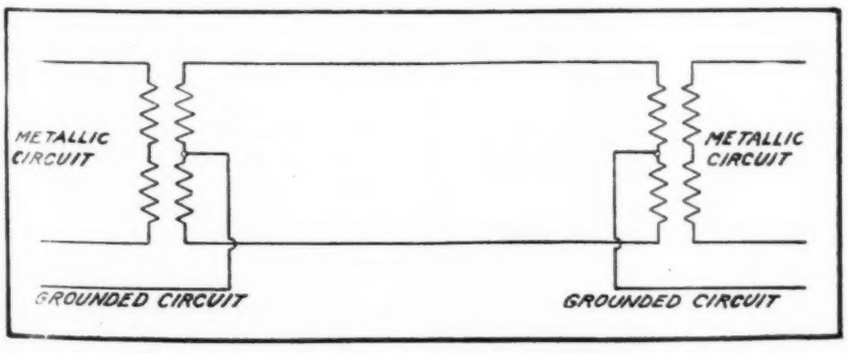


Fig. 1. The Simplex Circuit Showing One Metallic and One Grounded Circuit.

end to their juncture and then back to earth.

Since the current in the metallic circuit flows out over one wire and back over the other and the current in the grounded circuit flows out over both wires and back through the earth, the current in one wire is made up of the current of the metallic circuit and that of the grounded circuit flowing in the same direction, while that in the other wire is made up of the current of the metallic circuit and that of the grounded circuit flowing in opposite directions. In other words, in one conductor the two currents are added and in the other conductor the resulting current is their difference.

The repeating coils at the terminals of the line provide the filtering action which prevents the current of one circuit from reaching the terminal apparatus of the other. This filtering action is illustrated by the chart of the repeating coil, Fig. 2.

Fig. 2-*A* shows the condition when a current flows from one of the line wires into the coil at terminal No. 5 and out into the other wire from terminal No. 8 Since the current flows in the same direction through the coils 5-6 and 7-8, they will both tend to magnetize the core in the same direction. If changes occur in the strength of the magnetic field as the voice current varies, voltage will be induced in the coils 1-2 and 3-4 which are connected to the metallic line.

In Fig. 2-*B* a current is flowing into the coil at the juncture of terminals 6 and 7. At this point it divides and flows through the two coils 5-6 and 7-8 and out over the two line wires in parallel. Since the current flows through the two coils in opposite directions, the magnetizing effects of the two coils will be opposite as shown by the arrows.

If these two effects can be made exactly equal, there will be no magnetic field set up in the core. Consequently, any change in the current flowing into the coil at the terminals 6 and 7 and out over the two wires in parallel will have no effect in creating a voltage in coils 1-2 and 3-4. Therefore, a telephone user whose set is connected to the terminals

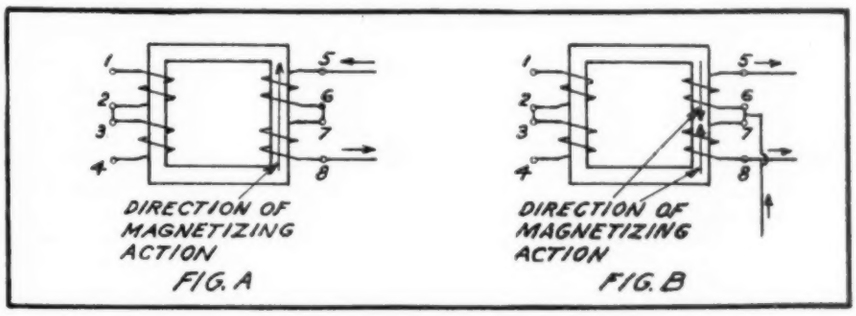


Fig. 2. Illustration of Filtering Current Action of Repeating Coil.

1 and 4 would receive no disturbance from the current flowing over the grounded circuit.

If for any reason the magnetizing effect of one coil is greater than the other, a disturbing current will be set up in the coils 1-2 and 3-4 and interference between the metallic circuit and the grounded circuit will result.

This may occur when the current in the two coils is not exactly equal as may be the case where one of the wires is slightly grounded or where one of the wires has a higher resistance than the other due to different conductor material or size or to high resistance joints. The same effect would be produced if the number of turns on the coils were not exactly equal, which may occur if lightning punctures the insulation and short-circuits some of the turns of one coil.

Simplex circuits are used extensively in practice for superposing a telegraph circuit on a telephone circuit. They are also used for dialing directly to subscribers of automatic exchanges from distant points over toll lines and for grounded telephone circuits where service conditions permit the use of grounded telephone lines.

The phantom circuit shown in Fig 3 is a metallic circuit obtained by using a simplex circuit on another physical circuit obtained as a return path instead of using the ground as in the previous circuit. In this case, the four wires of the physical circuits, or side circuits as they are commonly called, must have the same resistance or interference will result between the phantom and the side circuits.

If lines could be maintained in an ideal condition, it would be possible to superpose a third phantom on two phantom circuits thus making seven circuits out of eight wires, but the difficulty of operation increases as the number of superposed circuits increases. It is not commercial practice to superpose more than one phantom on a group of physical circuits although a simplex telegraph circuit may sometimes be worked over a well balanced phantom.

The preceding discussion suggests some of the requisites of a satisfactory phantom repeating coil. Among the more important are:

1. Perfect balance.
2. High talking efficiency.
3. High ringing efficiency.
4. High insulation.
5. Low resistance.

It was once thought that high talking and high ringing efficiency were incompatible, and a long period elapsed before a coil suitable in both respects for phantom work was produced.

The earlier coils were large, heavy and expensive and were not of the highest talking efficiency. In later years, the manufacturers have been able to secure a more satisfactory kind of steel for the core and have improved methods of manufacture and testing so that the phantom coil of today is scarcely larger and more expensive than talk-through coils and have a loss in transmission of less than one-half mile of standard No. 19 gauge cable.

The balance of a repeating coil includes not only perfect balance in resistance between the windings but also balance of inductance and capacity, as unbalance in any of these factors will result in cross talk. In some coils the wires of the two coils forming one-half of the coil are wound on the core together in order to have exactly the same length and number of turns.

Transpositions in Phantom Circuits.

An untransposed phantom circuit is subject to cross talk just as an untransposed physical circuit. This cross talk may occur between the phantom and other circuits, or between the phantom and its own side circuits. For this reason the transposition layout used on the lead on which phantom circuits are installed must provide transpositions on the phantom circuits as well as on the physical circuits.

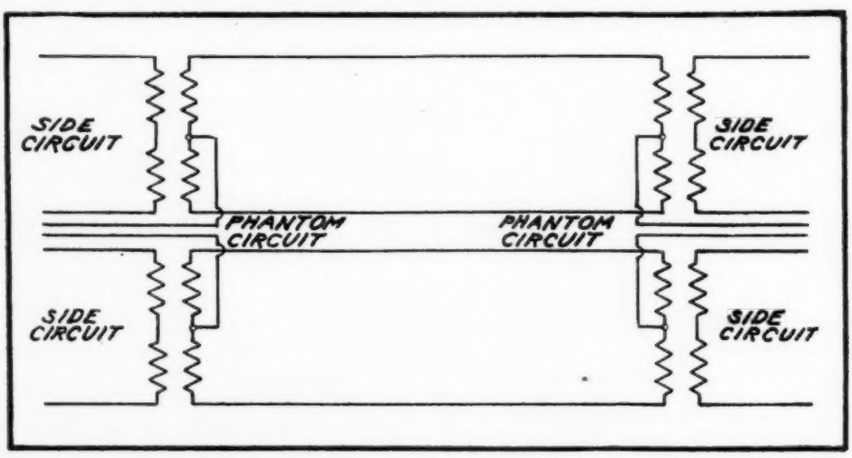


Fig. 3. Phantom Circuit and Two Metallic Circuits.

There are four types of phantom circuit transposition which are illustrated in Fig. 4. In type 1, both side circuits and the phantom circuit are transposed. In types two and three, one or the other of the side circuits and the phantom is transposed. In type four, the phantom only is transposed. These types are necessary as the cross-talk transpositions in the side circuits must be maintained and they sometimes come on the same pole as the phantom transposition.

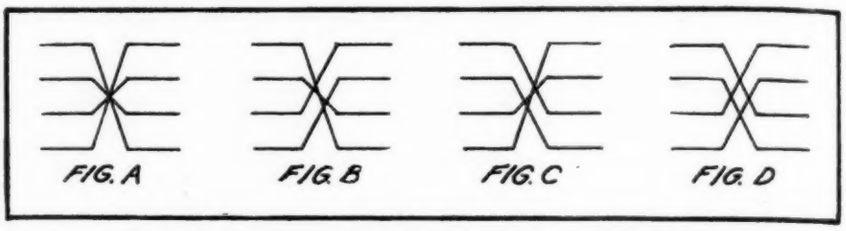


Fig. 4. Four Types of Phantom Circuit Transposition.

The modern form of the phantom transpostion employs a four-point bracket which does away with the use of special transposition insulators and maintains practically equal spacing between the wires. When transpositions are to be cut into existing circuits, it is sometimes necessary to keep the circuits working and special care must be taken to prevent interruption of the operation.

In some cases, special switching sets are used both in the office and out on the line. When the lineman is ready to make the cut, the keys are thrown and the wires are cut but service is maintained through the key set until the wires can be spliced again.

Phantom circuits can not be worked successfully through great lengths of ordinary lead-covered cables. This is due to the variation of the length and capacity of various conductors in the cable. For toll cables where many phantom circuits are employed a special type of cable known as "quadded cable" has been developed. This type of cable is used extensively for toll entrance cable and for toll cables between important centers.

The cable is made up in "quads" that is, in groups of four wires instead of pairs. Two wires are twisted into a pair, and two pairs are twisted together to form the quad. In this way the length and capacity of each wire of the quad is kept the same and, as the two pairs forming the quad are twisted together, both the side circuits and the phantom are transposed every few feet with respect to each other and to all the other circuits in the cable.

When phantoms are to be applied to loaded circuits, the loading coils on the physical circuits do not act as loading on the phantom and it is necesary to use an additional loading coil to load the phantom. The type of coil used to load the side circuit must be so arranged that the flow of current in the same direction on through the two wires of the pair does not interfere with the operation of the coil as a loading of the side circuit.

There is a tendency at the present time to revert to non-loaded circuits, particularly on open-wire lines, and to install telephone repeaters at shorter intervals.

Cost of Installing Phantom Circuits.

One of the factors that must be considered when the installation of phantom circuits is planned is the cost of the circuit as compared to the cost of a physical circuit to furnish the same facilities. There are two elements entering into the cost of phantom circuits (1) the cost of the phantom coils, mounting and protection and the installation of the coils; and (2) the cost of phantom transpositions.

It is not often the case that an entire new phantom group is strung—at least, as far as the smaller companies are concerned—and the rearranging of existing circuits before the phantom transpositions can be cut-in may increase the cost. However, it would not be fair to charge to the cost of the phantom the expense of trimming trees and other work of clearing up present circuits, as this is properly a maintenance charge on the present plant.

The cost of installing the four coils in two central offices where the necessary lightning arresters are already available might run from $30 to $40. If the coils are to be mounted on poles, the cost of housing, lightning arrester and ground would increase this figure.

The cost of phantom transpositions per mile of phantom circuit will vary over considerable limits depending upon the spacing of the transpositions, the distance from the office, the necessity of keeping

the circuits working, etc. It might be as low as $5 per mile on some jobs and twice that on others.

In any case, however, it can be said that the cost of phantom transpositions per mile of phantom circuit would be less than the cost of stringing physical circuit. This would indicate that phantom circuits should be employed wherever the side circuits are available and the saving would amount to about the cost of wire for physical circuits, less the cost of the coils and installation.

The lower cost of phantom circuits compared to physical circuits has led to the use of phantoms on toll circuits wherever the required number of physical circuits are available. Long distance plants are so designed that a circuit which is not to be phantomed at once is placed in a pin position such that when another circuit is added, the two will form a phantom group by cutting in the phantom transpositions.

The circuits on pins 1 and 2 and 3 and 4 usually form one phantom group and those on pins 7 and 8 and on 9 and 10 form another group. Circuits on pins 5 and 6 are usually formed into vertical groups with those on pins 15 and 16.

Transmission Efficiency.

The statement is often made that phantom circuits talk much better than physical circuits. It is rather difficult, however, to find any definite statement as to just how much more efficient the phantom is. In the first place, the introduction of the phantom coils makes a slight reduction in the efficiency of the side circuits.

This reduction, allowing 0.4 mile of standard cable per coil or 0.8 for the two coils, is equivalent to increasing the length of a No. 12 NBS 0.104 in. diam. copper circuit or a No. 10 B&S (0.102-in. diam.) by about 10 miles. This would reduce the maximum length of this type of circuit permissible between toll centers by about 5 per cent. On No. 12BWG iron wire circuits, the effect of adding phantom coils is the same as that of increasing the length between two and three miles.

The transmission on a phantom circuit is better than on a physical circuit due principally to the fact that the resistance of the two wires in parallel is half the resistance of the single wire of the physical circuit. This does not mean, however, that the phantom may be used for twice the distance that one of its side circuits may be used.

Transmission efficiency depends upon the capacity, inductance and leakage of the wires as well as the resistance, and in all of the commercial types of circuits the capacity is the predominating factor in causing a loss in transmission. The capacity of a phantom circuit is higher than that of a side circuit and so the increase in capacity prevents the realization of the full benefit of the decrease in resistance.

The actual proportion for No. 12 NBS (0.104-in. diam.) copper circuits is that 85 miles of physical circuit is equivalent to 100 miles of phantom, considering only the circuit itself without terminal losses. This means that the loss in the phantom is 15 per cent less than in the non-phantomed physical circuit.

To illustrate this in another way, a table has been prepared comparing the transmission equivalents of a non-phantomed physical circuit, a side circuit and a phantom circuit of No. 10 B&S copper wire. The circuits are assumed to be 50 miles long and to be terminated with a very small amount of cable at each end. The loss assumed at each end due to cable, heat coils and switchboard wiring is assumed to be 0.5 mile of standard cable.

Under the conditions, the transmission equivalents are respectively 4.95, 5.65 and 4.65 miles of standard cable. This shows that the phantom is about 6 per cent better than the non-phantomed cricuit and side circuit is about 16 per cent poorer. If the length of the circuit were increased in length to 200 miles with the same terminal conditions, the phantom would be about 13 per cent better and the side circuit about 3½ per cent poorer than the non-phantomed circuit.

Practical Application of Phantoms.

In applying phantom circuits to existing plant, it is well to keep in mind some of the more important points that may affect the successful operation of the phantom. The side circuits should be of the same gauge and kind of wire and should not differ too greatly in conditions.

This latter applies particularly to iron wire circuits as it would be inadvisable to phantom two circuits, one of which is new wire and one old and corroded as it would be practically impossible to balance the circuit. The same thing would apply to circuits having different gauges of wire, and it would be out of the question to attempt to phantom an iron and a copper circuit.

The circuits should be located in the proper pin positions to permit of the installation of the phantom transpositions and should not be carried through any great lengths of subscribers' cable. In fact, it is to be recommended that the circuits be carried to the office pole wherever possible and the entrance made by means of a No. 14 B&S copper twisted pair. This applies particularly to smaller offices and cases where regular toll entrance cable is not installed.

The wires should then be gone over and all trees trimmed and other possible grounds removed. A preliminary test should be made of the insulation and the resistance of the wires. The insulation test is the ordinary one made with the wire chiefs voltmeter on each wire separately with the distant end free.

The resistance test may be made with a bridge making a loop test with the distant end of the circuit short-circuited and grounded, in which case the resistance on each side of the loop to ground should be the same. This test may also be made with the shunted voltmeter with the distant end short-circuited and grounded, in which case the voltmeter reading should be approximately the same from each wire to ground. If the reading is not the same, it is probably due to a high resistance joint which may be located by repeating the test at different points on the circuit until the trouble is located.

After the wires are cleared up, the transposition scheme should be laid out and the transpositions cut in. The manufacturers of phantom coils will supply transposition layouts or the information may be obtained from some of the telephone text books or specification handbooks. Care should be taken that the transposition poles are spaced evenly at the standard distance, 1,300 feet, and it may be necessary to check the distances on old pole lines. After the circuits have been transposed, the insulation should be again measured and the resistance checked to make sure that each wire has exactly the same resistance.

If the phantom coils are to be located in central offices, the ordinary protection will be sufficient to protect the coils. If they are to be located outside on poles, suitable protection from the weather should be provided and an efficient form of lightning arrester with a good ground should be installed. There are many satisfactory forms of arrester on the market for this purpose.

The central office wiring, whether connected through a test panel or not, should be arranged so that the phantom coil can be cleared from the line and testing instruments connected directly to the wires in case of trouble.

Ringing trouble frequently occurs where intermediate stations are cut

	Non-Phantomed Circuit.	Side Circuit.	Phantom Circuit.
Terminal loss, per mile standard cable	1.0	1.0	1.0
Line loss on 50-mile circuit, standard cable	3.95	3.95	3.35
Repeating coil loss, standard cable	...	.8	.3
Total loss	4.95	5.65	4.65

Comparison of 50-Mile Circuits.

across a side circuit, as far as possible the circuits should be arranged so that no stations are cut across the lines between the phantom coils. This, of course, is not always possible where farm lines are phantomed.

Ringing trouble may also occur on grounded phantoms if a grounded ringing generator is used, or in cases where an ungrounded generator is used, if it happens that the grounded lines are being rung at the same time.

Phantom circuits may be used in many different combinations with physical circuits. A phantom circuit may be extended by means of a physical circuit or a long physical circuit may be looped through an intermediate point and phantom coils cut in to form a phantom with a shorter circuit. A long physical circuit may have more than one phantom superposed on it at different portions of its length.

It must be remembered that each set of coils introduced a transmission loss in the circuit and a too complicated arrangement may not be satisfactory. The writer recalls one circuit about 90 miles long that was made up of sections consisting successively of a side circuit, a phantom, a non-phantomed physical circuit, a side circuit and a phantom, the circuit being carried parallel to itself in one place for several miles.

Needless to say, the arrangement could scarcely be expected to form an efficient circuit.

Maintenance of Phantom Circuits.

Circuits which are phantomed are subject to a greater amount of trouble than non-phantomed circuits. A case of trouble on one wire will affect not only the side circuit but the phantom as well and, in certain cases, trouble will throw out of service the entire group. Test panels are usually arranged so that the coils may be cut out to restore service on at least one side circuit in case of trouble.

Inductive interference is usually more severe on phantoms than on side circuits. In one study covering several hundred circuits distributed over a large area, it was found that 60 per cent of the phantoms showed more than a certain amount of noise when tested with a noise-testing set while only 35 per cent of the physical circuits showed the same amount.

On account of the greater susceptibility of phantomed circuits to trouble, higher standards of maintenance must be established than for lines consisting exclusively of non-phantomed circuits and, therefore, the cost of maintenance per wire mile is increased.

Taking into account the greater number of circuits and the improved service, however, the use of the phantom is well justified and should be extended wherever the physical circuits are available and the facilities needed.

LOCAL OPERATING PROBLEMS

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

In local operating, our problem is not the difficulty of knowing when to use the appropriate phrases and how to use the equipment in establishing connections, but it is in the selection and training of young women who will represent their employers in just as satisfactory a manner as though they were dealing personally with their own patrons.

I have talked with a great many managers and chief operators and have obtained many viewpoints, some of the best of which are:

In choosing an applicant, her school record must be taken into consideration. If she is a girl who has had one troublesome record throughout her school life, she will not be responsible for serving others.

What I mean by "troublesome" covers several conditions. Sometimes she is indolent and will not apply herself to her studies. Of course, there are frequently physical causes, which, being removed, alter the student's attitude toward her studies. Perhaps, she has never known any home restrictions; the telephone office, especially the small office, is a very unsafe place to put her—so far as she is concerned, as well as her patrons and her company.

Some times she is a girl who has never been physically fit, and her frequent absences from school have caused her to lose interest and thus drop out and idle a few years, which is even worse for her; then if she applies and is accepted, she is worthless and a drag to all concerned—especially to her patrons. That is the most unfair part.

Various other conditions which make for negative results, besides bad examples, might be enumerated.

Our problems disappear like snow in summer when our employes are chosen with the foundation purpose of giving our patrons satisfactory service.

National Association Directors to Meet, May 8.

President F. B. MacKinnon and Secretary C. C. Deering have sent out a call for a meeting of the board of directors of the United States Independent Telephone Association, to be held May 8, 11 a. m., at the Hotel Sherman, Chicago.

The official call adds: "This will be the semi-annual meeting of the board at which will be considered the date of the next annual convention of the association, routine matters relative to the association's business affairs and any other matters that should have the attention of the board.

"This will be a very important meeting and it is hoped you will be sure to attend."

District Meetings of Up-State Association of New York.

There was a very large attendance of telephone companies from Schoharie, Albany and Delaware counties at the sub-district meeting, held at the offices of the Up-State Telephone Association of New York, in Albany on Tuesday, April 25. Owing to the unavoidable absence of District Vice-President Green, who is in charge of distict No. 3, the meeting was presided over by J. G. Ihmsen, vice-president and general manager of the Up-State association.

Fourteen telephone companies responded to the call for the meeting, and after discussing the various problems with which the companies are confronted in their territory, it was concluded that the subject of the greatest importance was the matter of inadequate telephone rates.

As a result of inquiries it was found that the companies are all giving a good grade of service but that the rates have not been advanced to meet the increased cost of maintenance and operating, mainly for the reason that there has been no organization to bring about uniform action.

Mr. Ihmsen opened the meeting by reading to the members a number of decisions from various public service commission reports, showing that the regulatory bodies are willing to sustain a fair and reasonable rate where the class of service warrants it.

Mr. Ihmsen finished his talk with a lecture to the members present, on the folly of conducting the telephone business on the basis of service to the subscribers at cost.

It was proposed to increase the multi-party rural service charge from $12 to $21 per year and the village rates from $18 to $24 per year.

The next sub-district meeting of the Schoharie division will be held at Middleburgh, Schoharie county, on Friday, May 12.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

"I Wish I Had My Money Back."

For many years I toiled and saved,
From morn till night I worked and slaved
That I might get a bunch of dough
To keep me when I'm old, you know.
One day I chanced to meet a man
Who whispered low that I should buy
Some stock in his great well of oil.
"You'll soon be rich and cease to toil,"
He said; and it sounded nice and true.
He took my hard-earned cash and flew.
I wish I had my money back.

I wish I had my money back,
Straight to the bank I'd take the "jack."
I'd leave it there at five per cent,
And with it safe I'd feel content.
No more for me the siren lure,
One dose has more than worked a cure.
How I wish I had my money back.

I met a girl not long ago.
Her looks were good, she wasn't slow;
She quickly had me in her train.
My hard-earned cash I spent like rain,
I took her to the best cafes,
Night after night we went to plays,
Until at last my cash ran low,
When she shook me for another beau.
Now I wish I had my money back.

Probably since the adoption of money as legal tender, every man who has bought a lemon has expressed, either mentally or audibly, the sentiments expressed above. How many times have those words passed through the minds of multitudes of people, or at least their equivalent in whichever language the person was accustomed to use.

Whether the money has gone in speculation, dissipation or involuntary donation, it is but human to wish it back. Instead of people getting wiser as time goes on and avenues through which your hard-earned cash can leak away, becoming closed by education, there are multitudes of new and heretofore unheard of ways in which the sweat of toil can be dissipated by the breezes of adversity.

"You remember, don't you, how you used to order telephones and wire and poles, etc.?"

Not only is the money gone which has been poorly expended in speculation, but in commercial life also, the making of bad investments eat up your capital quite as rapidly and just as completely, if you don't watch out.

In many years of experience in any field of human endeavor can experience be obtained which should stand in good stead and serve to make the investor immune from further loss from the exercise of bad judgment, but such unfortunately is not always, or scarcely ever, the case. The gray-haired still buy cheap hair dyes, and the bald-headed man is yet the best customer for hair restoratives.

Hope springs eternal in the human breast and, in the bosom of the natural-born sucker, the crop is most abundant and hardy. One by one new and muchly-advertised articles come on the market in all lines of business and, for the most part, fade away and are forgotten in a short time except for the remembrance of what they cost and the making of a few mental notes of what we could buy with the money, if we now had it.

Thousands of articles are introduced and thousands of formulas invented or discovered by the human race. But with a multiple of patent buttons on the market, the shingle nail still runs them all a merry race in keeping the suspenders firmly affixed to the trousers of mankind. People readily take up new fads and fancies but sooner or later revert to the primitive habits which are the cornerstones of humanity.

Of the thousands of innovations which have flashed across the horizon and soared to the zenith of our modern life, few have been really adopted—and those few, while seemingly new, are really but a modern modification of refinement of the same thing, which in cruder form has been the heritage of the ages. Take telephoning, for instance: We think it is new but the only thing particularly new about it has been the adoption of the use of wire as a vehicle for carrying information.

The war drums of the Zulu, the yoedeling of the Swiss mountaineer, the smoke messages of the Apaches and the carrier pigeons of ancient Rome, are all forms of telephoning or transmitting information beyond the ordinary range of the human voice. Next to getting there rapidly ourselves, the getting there with our voice is a prime requisite and always has been.

Now comes this newer and more potent form of transmitting sounds, or rather the discovery that they can be so transmitted and caught up again, the radio. What will be the history of the promoting of this new baby? Will thousands wish they had their money back after buying either promotion stock or apparatus?

"And it sounded nice and true. He took my hard-earned cash and flew."

Will thousands rush in, thinking they only have to lay down their money and to immediately take it up again increased many fold, when dealing in shares of new radio companies? Probably. In fact, more than likely. Will any so profit? Possibly a few.

Will it supersede and make worthless our telephone plants and investments? Not at all. If it has any effect, it will be to help, aid and assist the older enterprise.

Will those who speculate and lose in plunging in this new venture wish they had their money back? Undoubtedly. Thousands of telephone companies all over the country are clamoring for radio sets to supplement their present telephone service in giving their patrons the benefit of quicker returns on markets, weather and other items of interest. Would it not be better to thoroughly investigate matters first so as to be sure you get the type which will best fit your needs before you proceed in this new venture?

Some will rush in and say to the electrical dealer, "Gimme a radio set," without specifying as to further details. You remember how you used to write your order for telephone sets, "Send me one dozen telephones by express," without any explanatory details as to make, type or finish. Why did you do this? This you know: You didn't know much about telephones except that you saw a need for them and wanted to supply it.

Do you order telephones that way now? You do not! You explicitly specify the make, type, finish, and every little thing—and you get just what you know you need for where it will be used. It will be of a standard make, too, and you will get a maximum of service.

You remember, don't you, how you used to order telephones, and wire, and lightning arresters, and poles, and batteries and such things, in a vague and haphazard way? Did you ever get fooled when you received the consignment? Did you find that you had the wrong type of telephone and had to return the shipment? Did you some morning find a shipment of fence wire delivered by the drayman, instead of the kind you order now?

You remember you got wet batteries some times and some times dry batteries, and were put to a lot of inconvenience thereby. You got a lot of telephones too, which were soon junked because the manufacturers of that type had rushed into the market with an assembled makeshift contraption before really bringing it anywhere near a decent point of real usefulness and dependability as to service. The factory expended thousands of dollars in manufacturing a cheap, unreliable type of apparatus and both the stockholders in the concern and the people who bought the stuff soon were wishing they had their money back.

Will history repeat itself in the radio game, in this wise? Undoubtedly. Wouldn't it be better to wait and find out what we need before we rush into the market and buy the first thing we can get from anyone we can get to take our order. Of course—but, we won't.

APHORISM: Fevers are always "catching."

Vail Medals Awarded Chesapeake & Potomac Employes.

Three women and 11 men employed by the Chesapeake & Potomac Telephone Co. of West Virginia have received awards of Theodore N. Vail medals in recognition of devotion to duty during the labor disturbance in the Southern coal fields in 1921.

The women to whom the medals were given are operators at Matewan, Mingo county. The citation accompanying the awards said that they had continued to operate the switchboard during the period of the coal strike in Mingo county and "for months at a time were subjected to almost every known epithet and criticism that could be hurled at them." "The lives of these young women," the citation continued, "had even been threatened unless they would leave the town." They are Miss May Chafin, Miss Elsie Chambers and Mrs. Charles C. Ward.

The awards to the men, who were members of the Charleston division plant forces, were chiefly the result of efforts to maintain communication during disturbances in Mingo last May, and the armed march of the miners from Marmet to the Logan-Boone County border in August and September.

The men to whom the awards were made were Noah Rose, Russell Holland and Thomas Moses, linemen of Charleston; John F. Cox, combination man, of Williamson; Albert M. Gardner, lineman of a construction crew of Charleston; Jefferson H. Ronk, combination man; William Ronk and W. F. Walker, linemen, of East Bank; Lester E. Thompson, combination man; John S. Maynes, repair man, and C. R. McCoy, lineman of Logan.

Edwin F. Hill, division information manager, of Charleston, received a medal for his assistance in connection with the locating of an army airplane, wrecked in Nicholas county, September 3, and in saving the life of Corporal Alexander E. Hazelton, the only one of the aviators who did not meet death.

January Summary of Reports of Class A Telephone Companies.

An increase of 5.1 per cent in the number of company telephone stations in operation during the month of January, 1922, over January, 1921, is indicated by the statement of the Interstate Commerce Commission shown on this page, relating to Class A companies.

Telephone operating revenues increased 8.6 per cent over January of last year, while expenses increased 2.5 per cent. The operating income was 27.7 per cent greater. The January, 1922, expenses were 71.35 per cent of the revenue, while the expenses last year were 75.59 per cent.

Item.	For the month of January		Increase or decrease (*).	
	1922.	1921.	Amount.	Ratio. Pct.
Number of company stations in service at end of month	9,836,074	9,357,491	478,583	5.1
Revenues:				
Subscribers' station revenues	$30,421,342	$27,616,711	$2,804,631	10.2
Public pay station revenues	2,162,125	2,088,136	73,989	3.5
Miscellaneous exchange service revenues	436,766	419,054	17,712	4.2
Message tolls	11,555,850	10,981,003	574,847	5.2
Miscellaneous toll line revenues	1,323,068	1,259,952	63,116	5.0
Sundry miscellaneous revenues	786,156	637,886	148,270	23.2
Licensee revenue—Cr.	1,748,025	1,584,615	163,410	10.3
Licensee revenue—Dr.	1,734,853	1,582,386	152,467	9.6
Telephone operating revenues	$46,698,479	$43,004,971	$3,693,508	8.6
Expenses:				
Depreciation of plant and equipment	$ 6,835,518	$ 6,123,114	$ 712,404	11.6
All other maintenance	6,588,274	6,342,566	245,708	3.9
Traffic expenses	13,208,291	13,797,405	*589,114	*4.3
Commercial expenses	4,406,832	4,165,812	241,020	5.8
General and miscellaneous expenses	2,278,607	2,080,118	198,489	9.5
Telephone operating expenses	$33,317,522	$32,509,015	$ 808,507	2.5
Net telephone operating revenues	$13,380,957	$10,495,956	$2,885,001	27.5
Other operating revenues	$ 1,043	$ 4,304	*$ 3,261	*75.8
Other operating expenses	1,204	4,364	*3,160	*72.4
Uncollectible operating revenues	212,128	137,247	74,881	54.6
Operating income before deducting taxes	13,168,668	10,358,849	2,810,019	27.1
Taxes assignable to operations	3,576,607	2,848,761	727,846	25.5
Operating income	$ 9,592,061	$ 7,509,888	$2,082,173	27.7
Ratio of expenses to revenues, per cent	71.35	75.59	*4.24	*5.6

Statistics of Operations of Class A Companies for January.

Southern California Company Announces Large Expenditures.

Following a recent meeting of the board of directors of the Southern California Telephone Co. in Los Angeles, Chairman G. E. McFarland announced authorized expenditures aggregating $1,791,250. This is in addition to approximately $2,350,000 appropriated at the January meeting of the board.

The sum of $970,000 was specifically appropriated for central office equipment in the Hollywood, Vermont, Olive, Adams, Boyle, Wilshire, West and Prospect offices.

For additional underground construction an amount approximating $191,000 was set aside, the largest item being $66,100 for work on Stephenson avenue. Additional aerial wires and cables will cost in excess of $52,000, new construction between the Garvanza and Occidental exchanges absorbing $25,820 of this amount.

Approximately $108,000 was appropriated for building improvement and additions, divided among the Hollywood, Vermont, Garvanza, Prospect and Daly exchanges.

The company has announced a $9,000,000 extension and improvement schedule for 1922. Its appropriations of more than $4,000,000 to date in the year indicate an adherence to the plans which cannot but result in an improved and extended service. To the construction program calling for the expenditure of $750,000 per month, is added a monthly pay roll of nearly $600,000.

Appropriations of $6,000,000 by Illinois Bell This Year.

The Illinois Bell Telephone Co. announces that at the April 26 meeting, its board of directors approved an expenditure of $1,628,842 covering new plant for the City of Chicago, and for Illinois outside of Chicago, $956,322, a total of $2,585,164—making the total approved this year, $6,219,548.

Radiotelephony and Wire Systems

Conference Proposes New Laws for Radio Control.

The radio telephone conference, called some time ago by Secretary of Commerce Hoover to help solve the present chaos in the air, on April 27, rendered its final report, on which will be based control legislation to be asked of Congress. The report is the outgrowth of tentative suggestions made a month ago by experts and subsequently reviewed.

Under the final report a wave band of 150-275 meters is assigned for amateur telegraphy and telephony and for technical training schools, the amateur having exclusive rights to 150-200 meters, while the training schools must use 200-275. There is also restricted special wave of 310 meters for special amateur radio telegraphy, this to be used by a limited number of inland stations, and only where it is necessary to bridge sparsely populated areas or to overcome natural barriers.

"It is recommended," says the report, "that the wave band assigned to amateurs, 150 to 275 meters, be divided into bands according to the method of transmission, damped wave stations being assigned the band of lowest wave lengths, interrupted or modulated continuous wave radio telegraph stations the next band, radio telephone stations the next band, and finally, unmodulated continuous radio telegraph stations the band of highest wave lengths. It is recommended that amateurs be permitted to carry out broadcasting within the wave lengths and assigned by the Secretary of Commerce to amateur radio telephony."

As the conference was designed primarily to recommend government control, the report suggests that Secretary Hoover be authorized to govern the establishment of all radio transmission stations except amateur, experimental and government, and also the operation of non-governmental stations. These recommendations will be carried out in the bill now being drafted by Representative White of Maine,

The conference passed resolutions declaring radio communication a public utility that should be controlled by the government, and recommended that "the type of radio apparatus most effective in reducing interference should be made freely available to the public without restriction."

There was such a demand for wave bands that the conference disapproved "of the elimination of essential services by the introduction of indirect advertising which might be expected to require extensive assignment of wave bands if permitted at all."

It decided that indirect advertising should be limited to a statement of the call letter of the sending station and of the name of the concern responsible for the matter broadcasted, even this to be subject to further regulation under the proposed control.

"Point to point" communication or communication between two fixed points, instead of general broadcasting, is discouraged by the conference, which says this method should not be used when other means are available—for instance, the land telephone and telegraph. The conference thinks too much air space is used in "point to point" work.

Recommendations are made that the Secretary of Commerce assign to each radio telephone broadcasting station a power range of 600 land miles for government stations, 250 miles for public broadcasting stations, and 50 miles for private and toll broadcasting stations; that the same wave band or overlapping wave bands should not be assigned to stations within these distances of each other; government, 1,500 miles; public, 750 miles; and private and toll, 150 miles.

Special recommendations pertaining to amateurs offered by the conference are that the status of the amateur and the limits of the wave band allotted to him be specified by law; that the amateur continue under the jurisdiction of the Department of Commerce, and that for the purposes of self-policing among the amateurs, amateur deputy radio inspectors be created, elected from their number by the amateurs of each locality.

The conference adopted at its final meetings a new provision recommending that the operation of government stations be conducted in such a manner as not to interfere with commercial traffic and broadcasting.

The report recommends the appointment by the President of an advisory committee to the Secretary of Commerce to consist of 12 members, half of whom shall be from the government and half from civil life.

The general allocation of wave lengths provides: Transoceanic service, 6,000 meters; fixed radio telephony, non-exclusive, 3,300; mobile service, non-exclusive, 2,650; government broadcasting, 2,050; aircraft, 1,550; city and state public safety broadcasting, exclusive, 285; amateur, 275.

New York Central Experimenting With Radio for Trains.

If experiments recently planned prove successful, passengers on the Twentieth Century Limited, the Lake Shore Limited and other famous New York Central trains may soon be able to telephone by wireless while riding over the road at a 75-mile-an-hour pace. Officials of the New York Central Railroad and engineers of the research department of the American Telephone & Telegraph Co. have arranged for a study of conditions which would be encountered in the use of the wireless telephone on moving passenger trains, and positive action is expected soon, the executives say.

These experiments will include the use of the wireless between the head and rear ends of long freight trains, and between the tug dispatcher's office and the New York Central tugs and other boats that ply about the New York harbor. The executives have little doubt that the wireless telephone can be used for the purposes mentioned, and that it is simply a question now as to whether the cost of installation and maintenance will make the adoption of the new system prohibitive and whether the apparatus can be made rugged enough for train service. The rapid development of the new communication system indicates that the latter difficulty is likely to be overcome.

According to the railroad's program, the wireless telephone service would be used in train service not only for communication between the head and rear ends of 50 to 100-car freight trains, but also between moving trains and dispatchers' offices or other fixed stations.

"Such use would be valuable in the operation of the railroads," says the current issue of the company's magazine in announcing the plan, "especially for communication between the front and rear of freight trains, some of which are now a mile long. In the event of anything getting out of order on such a train while it is running, the ability of the conductor to communicate almost instantly with the engineer would be a most valuable adjunct to the present methods. In handling the New York Central fleet of tugs and other boats—this carrier's fleet numbers 306 units—the use of the radiotelephone would be particularly worth while in time of heavy fog or other emergencies."

In course of time, officials believe, a pasenger will be able to go to the observation or club car on the Twentieth Century Limited and put in a call, while riding over the lines, for his office at New York to issue orders regarding business transactions; or for his residence, perhaps, to tell his wife that he forgot some of his wardrobe and have it forwarded on the next train.

"While this wireless or radio telephone and telegraph communication will, undoubtedly, develop wonderfully," continues the analysis, "it is not thought that it

will supersede the wire lines, because of the many difficulties that would have to be overcome, and its limitations, but such wireless systems will be used as an auxiliary for special situations.

"There is a system designated the 'wire carrier system' of telephony and telegraphy, which is similar to the radio but uses the existing wires as a guide instead of having the current sent broadcast. The advantage of this system is that it will provide communication that will be secret and permit of a large number of circuits to be obtained simultaneously over, or guided by, one wire, and thus with several wires there is no limit to the number of additional circuits that could be set up.

"This system is now in practical service by the American Telephone & Telegraph Co. It seems that, while this 'wire carrier system' can be developed so as to give an unlimited number of additional circuits, the radio must, of necessity, be limited, on account of the interference, to avoid which the use of the ether has to be arranged so that certain parties at certain times can use certain wave lengths. These limitations, of course, will restrict the use to perhaps 100 simultaneous conversations."

Accomplish Elimination of Battery from Radio Receiving Sets.

Elimination of the storage battery, the most expensive part of the home-made radio receiving set, is now possible, according to the Bureau of Standards.

The new receiving set connects with the ordinary electric lamp socket. The set may be used with any type of antennae, and by special means of connection it is even possible to use the electric light wires themselves as the antennae. The set consists essentially of an amplifier with minor auxiliary parts. It is described in a paper which will be published by the Bureau of Standards early this month.

The amplifier will utilize a 60-cycle alternating current supply for both filaments and plates of the electron tube, thus eliminating much of the interference met in an ordinary amplifier circuit.

"This interference," an announcement says, "has been practically eliminated by balancing resistances, grid condensers and special grid leaks of comparatively low resistance, telephone transformer in the output circuit, and crystal detector, instead of electron tube detector.

"In the final form of the amplifier there is only a slight residual hum, which is not objectionable. The amplification obtained with alternating current supply was as good as that obtained with the same amplifier used with the direct current supply. The complete unit is light, compact and portable. For the reception of damped waves, the amplifier as constructed worked most satisfactorily for wave lengths from 200 to 750 meters. This range was determined by the working range of the radio-frequency transformers used.

"By using suitable radio-frequency transformers it is expected that the amplifier will be effective for the reception of damped waves and undamped waves as long as 10,000 meters."

Brave Flood Dangers---Save Lives

Five Telephone Operators, by Staying at Their Switchboard While Flood Waters Eight to Ten Feet in Depth Swept Under and Around the Exchange, Saved Lives of Many Persons in Burlington, Kans.—Hours at Board

The heoric work of five telephone operators saved the lives of hundreds of people at Burlington, Kans., on the evening and night of March 23, when a flood swept that city, destroying nearly $750,000 worth of property and the lives of four people.

The operators—Hazel Bull, Margaret McCallion, Rose McCallion, Bessie Potter and Mrs. Junie Chubb—on learning at about 8:30 in the evening that flood danger was imminent, began to warn people living along Rock Creek, the little stream which was threatening to go over its banks.

When the danger became generally known, people began calling in for help. Then for four hours or more the girls were busy acting as a medium between persons caught by the water in their homes and places of business, and those trying to rescue them. In some cases the operators directed the rescuers in boats to those in grave danger. They also located relatives and friends of those saved, telling them that their friends were safe.

This was hard, exhausting, almost overtaxing work, and was coupled with the anxiety and fear that they might at any moment be hurled into the angry whirling current, which had risen to a depth of seven or eight feet in the building beneath them. Buildings all around them were collapsing; but it was not until they had helped a refugee through the skylight into the operating room that they learned that the store, which occupied the first floor of the building in which they were, had been swept away. They were in a mere shell that might at any moment float away on the crest of the swollen stream.

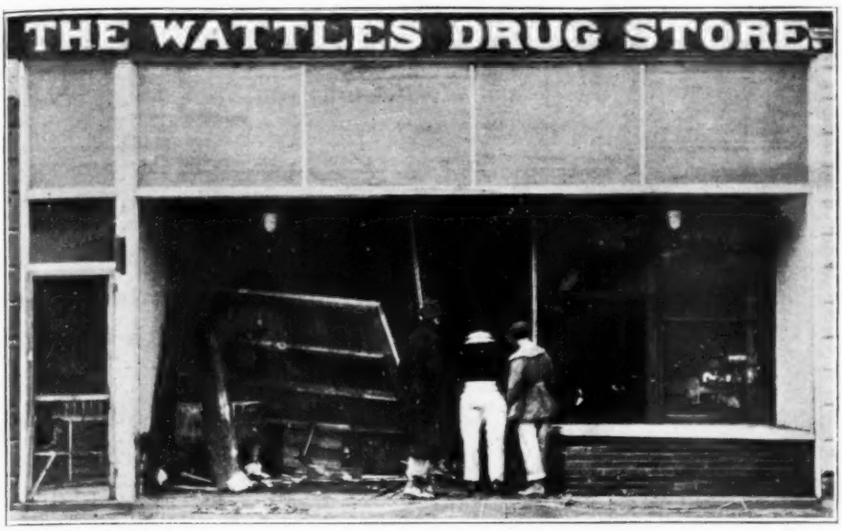
They did not leave the board. They did not even give up when the electric lighting system had been destroyed—when they were forced to grope blindly in the dark to make connections and to scatter broadcast flood warnings. While three operators worked on, the other two hunted up two kerosene lamps, which furnished the only light in that little room all the rest of that long night.

The Burlington, Kans., Flood at Its Height at Midnight, March 23.

In their attempts to save the lives of so many others, they did not stop to consider their own peril. These girls were continually on the job from 5 o'clock that afternoon until 12 o'clock the next day—19 hours. During this time

they had nothing to eat, and not until 2 o'clock, when the water had subsided, did they find time even for short rests.

"It was hard, but we never thought of quitting," said one of the girls. "Why, we could not have quit—not with those



Wreckage of Drug Store Just a Few Doors East of Building in Which Is the Exchange.

men and women and little babies in the flood-stricken area depending upon us to spread the word that meant life itself to them.

"The hardest part of all was to convince the people in the other end of Burlington that a dangerous flood was raging down where we were. Why, that little creek bed was always dry—and it was only six miles long. But in only a few minutes we found that it had been turned into a raging torrent that swept property and life ahead of it to destruction.

"Danger? Scared? Of course, we were scared. But we didn't realize the danger to ourselves—not at first. It was only later, when the real danger was gone for us, that we realized what might have happened to us. But it would have made no difference to us. We had to save the lives of those women and little babies if we could.

"But going back to the difficulty of getting residents of the higher parts of Burlington to organize rescuing parties. The people we called were sure a flood was impossible. Oh, yes, they knew there had been a heavy rain for hours, and that there had been hail—hail that filled ditches along the roadside—but they couldn't believe that dry Rock Creek could endanger people's lives."

But today Burlington, after dozens of the biggest business buildings in the city became mere piles of wreckage and the homes of many more dozens of persons were scattered along the Neosho River for miles below Burlington, knows that a flood is possible. The whole state came to the rescue, even as those five girls in the Burlington telephone exchange did that terrible night—but not as heroically. Others can help only by giving money—but those five girls risked their lives to save the lives of those flood sufferers.

These girls are not only heroines in the eyes of the hundreds of people who owe them their lives, but to all who have heard the story of their heroic work.

This is a splendid example of the way in which persons in responsible positions may creditably act when so much—even human life—depends upon them.

South Dakota Preparing for Its "Live Wire" Convention.

"A hummer! Life and activity every minute!" That's the promise of the program committee of the South Dakota Telephone Association, for its convention May 10, 11 and 12 at Mitchell.

The announcement sent out by President J. A. Steninger, of Parker, and Secretary-Treasurer J. J. Bollinger, of Bridgewater, states that the committee was fortunate in procuring some of the most prominent telephone men in the Northwest, and even men with a national reputation, to talk before the convention. The topics are timely, interesting and helpful, as may be judged from the following abridged list:

"Why are small exchanges often unprofitable, and how can they be changed from a liability to an asset?"

"Public relations."

"How to prepare rate cases, or other matter that may come before commissions, courts, etc."

"Problems of the owners of telephone property."

"Problems of maintenance and depreciation."

"Proper systems of accounting."

"Service connection charges."

"High tension electric line interference."

"Assessment of telephone property," by a member of the tax commission.

An address by a member of the South Dakota Railroad Commission.

One of the features of the meeting will be the "round table" discussions, which will enable each person to bring up questions that particularly interest him and which may not appear on the regular program. In fact, those who are planning to attend are urged to arm themselves with all their perplexing questions and "fire away" at the other "telephone knights of the round table," being assured that he will receive valuable assistance.

The second day of the convention will open with an operators' school. Operating methods and problems usually encountered will be discussed by competent traffic men. It is the hope of the committee that the "classrooms" will be filled during this interesting session, and it invites the companies to send as many operators as they can spare, for it will be a good investment.

Mr. Steninger and Mr. Bollinger have not divulged the form of entertainment, simply stating, "We ask you to take our word for it." But they do say it will be unique.

The invitation carries a friendly spirit, and is all-inclusive—"Everybody come and bring all you can with you. Directors, stockholders, owners, executives, heads of departments, superintendents, managers, operators, linemen and even subscribers will profit by attending this convention. The city of Mitchell, through its officials, extends a cordial invitation and guarantees to entertain us royally."

Headquarters will be at the Widman Hotel, and those attending are asked to register either at the secretary's desk there, or at the Mitchell city hall, as soon as possible after arrival.

District Meeting of Pennsylvania Association Held in April.

The forty-sixth meeting of the western group of the Pennsylvania State Telephone Association, which was formerly the Western Pennsylvania Independent Telephone Association, was held in Pittsburgh April 28 and 29. This meeting, while not as large as some of the former meetings, made up in enthusiasm what it lacked in numbers.

Some of the important matters taken up and acted upon, were a decision to arrange for the publication of a common toll directory for the use of the members of the western group, the employment of a service engineer, the re-establishment of operating schools, and holding of quarterly meetings.

The next meeting is to be held in July, date and place to be announced later.

Wisconsin Bell to Issue Only Two Directories a Year.

Only two issues of the telephone directory will be made each year instead of four times a year, it was announced by the Wisconsin Telephone Co. recently. The next issue will be on July 1, and the following on January 1, 1923.

"Beyond Expectations"

A surprisingly large number of ...ies because they know that it is impos...ren failing reliability with any other typ...ipm

After operating automatic equip...r s their expectations as to service valu...than saving in operating and maintenanc...s w

The manager of one such comp...tes that Automatic is the only real satis...serv standing features has been its econ...ope apparatus has proven beyond our e...ns f

Whatever the reason back of yo...on find that it will "prove beyond your ...tion companies.

The most convincing testimony ...he Automatic is contained in the opini...ose period of years. Their experience i...uide

Our sales engineer will be glad t...n t exchange without cost or obligation. ...pt for all types of service.

AUTOMATIC E...C

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New York City 21 East 40th St. | Cleveland 415 Cuyahoga Bldg. | Philadelphia The Bourse Bldg. | Columbus 516 Ferris Bldg. | Boston 445 Tremont Bldg. | Rochester Mercantile Bldg. ...troi ...rd

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INTERNATIONAL TELEPHONE SA...EN

International Automatic Telephone Company, Ltd., London

Compagnie Francaise pour l'Exploitation des Procéd...-H

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Procéd -Houston, Paris Automatic Telephone Mfg. Co., Ltd., Liverpool Automatic Telephones, Australasia, Ltd., Sydney

What Is Your Company Doing?

Chats About Company Doings.

By Stanley R. Edwards.

In connection with the telephone operators' school held at Fort Dodge, Iowa, recently, a program for it was sent out to the companies in that territory. The unique feature of this program was the invitation, set in Old English type, which read:

"You are cordially invited to attend our operators' annual school of instruction.

"We are planning an unusual and interesting program of educational value.

"Margaret Grace, Chief Operator.
Fort Dodge Telephone Co.,
Fort Dodge, Iowa."

There you have a little touch of the personal in the invitation through it being signed by the chief operator. That meant more to those receiving the invitation than if it had been signed with the name of the Fort Dodge Telephone Co. only. Think it over in sending out invitations.

Well Clay has a bunch of live girls in his exchange at Hutchinson, Minn. Recently he sent us a photograph of them, with this characteristic comment:

"I am sending this week an unmounted photograph of the bunch of girls who help to maintain the sunshine and sometimes deepen the shadows of my managerial career—the operators on the Hutchinson board."

This Group of "Live Wires," the Operators on the Hutchinson (Minn.) Board, Help Maintain the Sunshine of Well Clay's Managerial Career.

Looking at them as they appear on this page, we would be inclined to the opinion that they surely are a decided aid in maintaining the sunshine, so much of which pervades the Hutchinson exchange, as judged by Mr. Clay's weekly contributions to TELEPHONY.

From left to right, the girls are:

Back row: Martha Peterson, chief operator; Elizabeth McGraw, Myrtle Laugeson and Lillian Lund.

Front row: Edna Reimers and Elsie Runke.

We'll guarantee that the girls keep the traffic moving rapidly over the lines of the Hutchinson company, particularly with that new switchboard which was installed something over a year ago.

C. Y. McVey, of Cleveland, Ohio, former president of the Ohio State Telephone Co., recently spent some time in Hawaii, and was a traveling companion of A. F. Adams.

Mr. McVey was most emphatic in his statements as to the roughness of the Pacific ocean. He vividly related the experiences of the party during a storm, lasting some 48 hours, immediately after the ship left San Francisco. Then, he told this story of a present which F. B. MacKinnon, president of the United States Independent Telephone Association, sent to Mr. Adams:

Just before the ship left the dock in San Francisco, a large package was delivered, addressed to Mr. Adams. Wrapping after wrapping was removed, until finally it got down to a package somewhat smaller than a shoe box, and then was exposed to view a jar of raspberry jam.

Attached to it was this note from Mr. MacKinnon: "Here is the only thing I know of that tastes as good coming up as it does going down!"

Thursday, April 20, was telephone day at Hoopeston, Ill. E. J. Boorde, president of the Hoopeston Telephone Co., arranged for a telephone talk at both the high school and Chamber of Commerce.

W. S. Vivian of the Automatic Electric Co., Chicago, was extended an invitation to make the addresses. Mr. Vivian told "The Story of the Telephone" before the student body of the high school in the afternoon, and before the Chamber of Commerce at a dinner in the evening.

Mr. Boorde had every employe on his payroll at the dinner, having secured the assistance of ex-employes to carry on the work at the telephone office during the evening. Following the meeting of the Chamber of Commerce, the members of the entire organization were guests of the telephone company at a show in Hoopeston's new theater.

J. M. Plaister, newly-elected president of the Iowa Independent Telephone Association and general manager of the Fort Dodge Telephone Co., in an address before the "Know-Your-Own-Community" luncheon at the Fort Dodge Commercial Club recently, spoke most interestingly of telephony. Mr. Plaister in opening his address, told briefly of the intervention of the telephone and the controversy over patents. The first mention of the telephone, according to Mr. Plaister, was made in 1850, but it was not until June 2, 1885, that the first patents were granted to Alexander Graham Bell.

"From 1876 to 1897, the development of the telephone was slow, and less than 500,000 telephones were placed in this country during that period," Mr. Plaister said. "However, after that time the development increased, and from then to 1921 more than 13,000,000 telephones were placed into service in the United States. At the present time, 64 per cent of the telephones of the world are in the United States, although we have only 6 per cent of the population of the world. Fort Dodge now has one telephone to every three and two-tenths persons—a record probably not equalled by any other city."

He told of some of the improvements which are contemplated for Fort Dodge this year. His company recently issued bonds to the amount of $100,000, which were bought by residents of Fort Dodge and the proceeds will be expended almost entirely for outside improvements.

Mr. Plaister concluded his talk with what he termed the telephone psychology test. While every person remained silent he held his watch as it ticked off the seconds for one minute.

"Did you ever wait that long for Central?" he asked.

Under the heading "Big Crowd Sees Phone Work," the local LaPorte, Ind., newspaper published this item:

"More than 1,200 persons, it is estimated, witnessed a demonstration of the La Porte Telephone Co. in the window of A. J. Stahl's office between the hours of 2 and 9 o'clock Saturday.

"Those who gathered in crowds along the sidewalk spoke favorably about the demonstration. It was given 84 times by the young women in charge and carried to an amplifier which explained to the persons each process of the demonstration.

"The exchange switchboard, which the company has used at various gatherings in the city and county was used. Those who took part in the demonstration were: Miss Grace Hatfield, Mrs. Catherine Jarnecke, Miss Maude Wolf and Miss Edith Pratt. Miss Maebelle Cavanaugh was in charge."

In commenting upon the unique idea of giving a show-window demonstration, Frank V. Newman, general manager of the company said:

"I realized that there were many of our subscribers and the public in general who, perhaps, didn't avail themselves or did not have an opportunity of witnessing our previous demonstrations of the common battery switchboard. As Saturday in this town is the big shopping day on Main street, we had the switchboard placed in a prominent window of one of our local banks. As stated in the clipping, 'A loud speaker' furnished by the Automatic Electric Co. was used to convey the instructions to the crowd witnessing the demonstration.

'We have had exceedingly big results from this campaign of education, in fact, we had many requests for demonstrations which we were not able to carry out on account of the limited time we had for the use of the switchboard. One of the largest movie house managers was anxious for us to give one at his theater.

"In these various demonstrations, in order to bring out the education to the public, we would reproduce by using additional telephones where demonstrations were given, conversations indicating what interrupts the service—disputes of subscribers on party lines regarding long conversations, several women subscribers trying to get the use of a party line at the same time, often lengthy conversations in giving grocery orders, which could be given by a business man in a few seconds, failure to answer the telephone promptly often permitting it to ring two or three times, calling numbers by memory instead of consulting directory, calling party hanging up receiver before called party answers and then when called party did answer, the operator would say 'excuse it, please.'

"In the three demonstrations given before the high school and the seventh and eighth grade students, Miss Cavanaugh, our traffic superintendent, had an excellent opportunity to talk to the students on the profession of telephone operating.

"Fred Pitzer, the central office switchboard man, who graduated last June from our local high school and who has made rapid progress in his duties as switchboard man, talked on the various phases of the central office equipment with the senior students. This also gave him an excellent opportunity to explain to the young men the value of considering the telephone business for their future vocation.

"I know of no line of endeavor in my past three years' experience that I consider of so much value in an educational way as this campaign."

It might be mentioned incidentally that as a result of the "three years' experience" to which Mr. Newman refers, the public relations of the LaPorte Telephone Co. are in a most satisfactory condition. The La Porte people, if asked about telephone service and rates invariably speak "a few kind words" for the company and its employes.

The "tell it to them" policy which Mr. Newman inaugurated some three years ago has produced a wonderful change in public sentiment and opinion in regard to the telephone company.

Recently statistics have been published indicating that college graduates, making up only 1 per cent of our population, comprise more than 50 per cent of those who achieve leadership in the various walks of life.

The statistics show that this 1 per cent of college men has furnished 55 per cent of our presidents, 54 per cent of our vice-presidents, 36 per cent of the members of congress, 47 per cent of the speakers of the house, 62 per cent of the secretaries of state, 50 per cent of the secretaries of the treasury, 67 per cent of the attorneys general and 69 per cent of the justices of the supreme court.

It will be noted that in this list, the legal profession apparently predominates—and the business man is absent, although it is true that some of our presidents, vice-presidents, speakers of the house and members of congress have come from the ranks of the business men.

We rather doubt if the measure of success be applied to business men that the college educated man would make such a big showing, for the average successful business man is ordinarily a graduate of the "University of Hard Knocks."

However, to succeed in anything, one must be educated, no matter what method is followed—the college or the experience. Both in the end cost a great deal, the latter probably being the more expensive and harder course to follow.

If as a result of taking either of these courses a person learns to really think and reason, after acquiring a knowledge of certain fundamental principles, success is quite certain to follow.

From a mass of data it was computed that with an elementary education the chances for success are one in 41,250; with a high school education, one in 1,608, and with a college education one in 173. If statistics mean anything at all, education of some kind is most essential for anyone to get ahead in life. But not all educating is done in schools and colleges. Many successful men and women have been educated through studying books evenings and in odd moments and through their contacts and associations—and these people, it will be discovered, know how to reason and think things through. And that is the fundamental purpose of education..

Education gives knowledge—but success depends upon developing the ability the properly apply knowledge.

Hence, the more knowledge about our business we acquire with the full development of our abilities to properly apply the knowledge, the greater success we will attain.

Manager Frank V. Newman and employes of the LaPorte Telephone Co. furnished the program for a recent weekly luncheon of the Kiwanis Club of La Porte, Ind. A complete demonstration of the mysteries of telephony was staged by the company, and much which had previously been known to the employes alone was revealed to the laymen present.

Mr. Newman was ably assisted by Miss Mabelle Cavanaugh, Miss Margaret Norris, Miss Grace Hatfield and Fred Pitzer. Numerous dialogues between local people, as they are commonly recited each day, were gone over by the operators and the weaknesses pointed out. Not a little humor was worked into the playlet.

About 25 telephone operators were the guests of the club at the dinner.

New York City now has more than 1,000,000 telephones

The million mark was reached and passed in March, according to a recent announcement from the New York Telephone Co., which declares that on April 1 there were 1,010,320 telephones in the Greater City, served by 106 central offices. Manhattan leads the five boroughs, with Brooklyn second.

The National Telephone & Telegraph Co., serving Clinton, Ill., is showing everybody in town its plant. It has divided the city into districts, setting aside a day for residents of each section. They will be shown the equipment and given demonstrations of how service is rendered. This is a good effort towards making friends.

Some Hints For the Small Exchanges

A Suggested Resolution for Telephone Men to Keep Unbroken.

By L. M. Kraege, *Secretary, Kansas Independent Telephone Association.*

At the beginning of a new year every telephone man, like every other "human," feels the inspiration of future possibilities confronting him, and resolves to do something better than last year in improving his telephone situation. He wonders what it will be, where he will start in, and continues in doubt until the real heat of the resolution is expended, when he is likely to settle back into the routine of the former year and make no improvement.

Let me offer a good starting point. It is as old as the telephone game, as fundamental to success as the best kind of equipment installed in the best possible manner. In fact, it is all a telephone man has to sell to the public. It is his real stock in trade, his only commodity for which the public is willing to pay:

The one thing I wish to talk of at this time, is the service at your telephone exchange. The moment service is mentioned I can imagine a number of telephone men getting right up and saying: "My service is as good or better than any other service around here." That is perfectly all right, but should we stop there? Is that a good standard to follow? Is the service in my community the kind to be proud of? I do not like the term, "as good as." It always seems like begging the question or acknowledging the inefficiency of a thing, and then trying to "get by" with just as little as possible.

Doesn't it seem like holding down the standard? Isn't it like going into a drug store and calling for a standard, excellent remedy, that you know will meet your need, and the druggist tells you he hasn't it, but offers you something "just as good" with the idea of getting you to experiment with his "dope" or to unload upon you something upon which he can make a little more profit?

In regard to telephone service, would it not be a better standard to work always for the best possible service that can be given at each exchange? Don't you see it creates an entirely different standard, which always has an upward tendency for service rather than a lowering effect as in the other case?

There is a great demand the country over to require better telephone service, and the public has a right to expect it. A great deal of the discord in different localities may be traced back to poor service conditions and a failure on the part of the telephone man to try and improve the service. When an honest effort is made for better service, and the public is told of it, there will not be the discord and the objection to an increase in rates, when this becomes necessary.

The best kind of service at a telephone exchange is not wholly dependent upon the operators at the switchboard and the maintenance force at the exchange. They may be doing the very best they possibly can, with what they have to work with. If the equipment is not looked after constantly, and depreciation is allowed to creep in too fast, the service is bound to deterioriate even with the best kind of operating force, and the cost of the service will gradually increase, while the efficiency decreases.

Hence, can a telephone manager afford to neglect his equipment and replacements because the prices at present may seem a little high? It is poor economy to permit this condition at any telephone exchange, and in the end, when replacements are forced, they will prove more expensive than they would if the plant were constantly kept up. It's a case of "a stitch in time saves nine."

Beware of your depreciation! Remember, that RUST, ROT and DECAY, work nights and Sundays, and the eternal vigilance of the telephone manager is required in the fight against them.

We would, therefore, recommend as one strong resolution which must not be broken, that each telephone manager resolve to give the very best possible service from his telephone exchange from now on.

Begin Right Now!

Does "Safety First" Pay? Here Are Some Figures.

The cash value to telephone employes of following "Safety First" principles was illustrated by M. T. Caster, plant superintendant of the Lincoln Telephone & Telegraph Co., in a talk to 25 supervisors of construction and maintenance, gathered in Lincoln for the purpose of discussing problems that enter into their daily business life.

The company established a benefit fund in 1917, and in the five years of its operation it has paid out a total of $38,437 for accident and disability expenses. This sum, he said, would, if now available, enable the company to have kept at work five months the 81 employes in his department who were recently dropped from the rolls because of financial conditions.

Mr. Caster also pointed out that of the linemen and combination men, with whom the accidents are most numerous, the five years showed a total injured of 33.4 per 100. Before the war, the number was 45.7, while in 1919, when recklessness was rampant, the number per 100 ran up to 84.6.

In the five years, the benefit fund of the company has paid out $23,435 in accident benefits and $15,002 in payment of hospital and doctor bills. In addition to this, sick and death benefits of $21,119 have been expended, making a total of $59,566. The total payroll numbers 1,229 average for the five years, and an average of 12.28 per cent received benefits.

The total number of accidents was 493 in five years, and 219 cases of sickness were handled. The average cost of accidents per lineman and combination man employed was $259.71, which, multiplied by the average number of these men employed, 148, represents the money dissipated through accidents, many of which were avoidable.

The Method of Testing for Open Ringer Coils.

The substation trouble of open ringer coils is caused, very often, by lightning or a flow of high potential current. These ringer coils may develop an open circuit due to rough handling by installers. Sharp screw drivers or other sharp tools should not be used about a coil. These tools may cut the insulation or wire and form an open circuit.

In testing for this trouble, put the test set across the terminals of the ringer and have the operator ring in the usual way. It is proof that the ringer circuit is all right up to the ringer itself, if the set responds. Open one connection to the ringer and put the test set in series across this gap. The ringer is open if the operator rings and no noise is heard in the set.

Perhaps only one coil is defective. Connect the test set across each coil separately. When the operator rings, no noise will be heard in the test set when it is connected across the good coil.

An Advertising Hint for Spreading "Cost" Information.

One of the most important things in advertising is to place your advertisement before the people you most desire to reach, in such a way that they cannot ignore it.

At the present time most telephone companies have all the business they can handle—but they have to work against an established prejudice which the general public has against corporations in general, and public service corporations in particular. Therefore, the present subscriber is the party they most desire to reach with good-will advertising.

The people who are the most unreasonable and rabid are just the ones who are the hardest to reach with advertising. But, when they get their bills, they will go over them with a fine-tooth comb to see

if they can find something to kick about.

We have taken advantage of this fact by placing a short advertisement on our bill heads each month and we are reaching the subscribers very successfully this way. The cost of this advertisement is practically nothing while the results have been very gratifying. The reading matter is changed each month—for instance, in February we talked about the number of telephones and the cost of service, saying.

"Remember These Facts—

"The number of telephones in the Middletown district increased last year from 2,865 on January 1 to 3,093 on December 31, an increase of 228. It is worth more to every telephone subscriber to be able to call 3,092 other telephones than it is to be able to call 2,864 other telephones. The cost of furnishing telephone service per telephone always increases with the increase in the number of telephones available. Our increase last year was about 8 per cent."

On the March bills we said:

"Telephone service is the cheapest, quickest, and most efficient service obtainble; and with adequate telephone facilities the business man, the housewife and others have been able to avoid the expense of messengers, clerks, transfers, carfare and other more costly services. Residence telephones are now being furnished at less than actual cost of the service. It is only a question of time when prices must be advanced."

This reading matter is placed in the upper left corner of the bills where the subscriber's eye is sure to fall upon it.

F. D. FANCHER, General Manager,
The Orange County Telephone Co.
Middletown, N. Y.

Telephones Facilitate the Operation of Oil Pipe Lines.

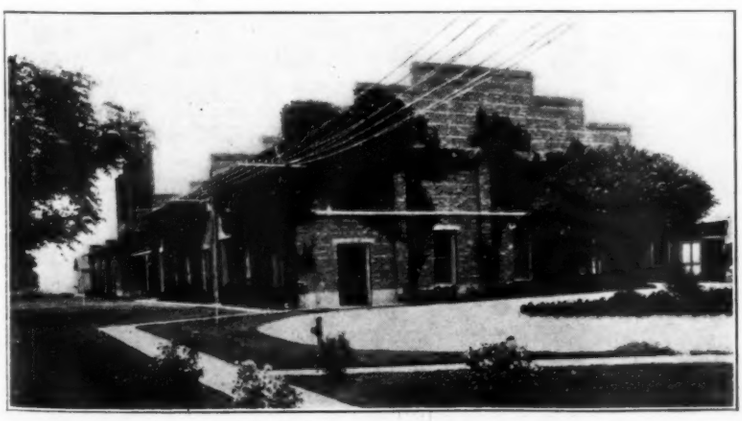
The advent of the oil pipe line stands out as the first big economic step in the development of the oil industry in California. The usual procedure in transporting oil through pipe lines is as follows:

In each of the oil fields there is a gathering system of pipes, radiating from large storage tanks at a pump station on the main line and extending to the various producing properties.

The illustration shows a typical pumping station with the telephone wires in the foreground. A frequent visitor at the pumping stations is the line walker. He drives a rig which enables him to carry a good equipment of tools. Owing to the character of the country some sections of the line are patrolled by men who travel on foot. Every foot of the pipe line is patrolled.

On the lookout for leaks, the line walker travels back and forth over that section of the line for which he is responsible—usually about 30 miles. If patrolling on foot, instead of repair tools, he carries a pair of climbing irons and a telephone instrument.

Wherever the company has an oil line, it also has its own telephone wires, and communication between stations is but the matter of a moment. When a line walker discovers a certain unmistakable discoloration of the ground in the vicinity of the line, he investigates to learn the nature of the leak. If it is of such a character that he cannot repair it, he immediately climbs the handiest telephone pole and reports to the nearest station. In a very brief space of time, men with the necessary tools and material are on their way to do the repair work.



Telephones Are An Important Factor in Oil Pipe Line Operation.

Locate Cable and Gas Pipes by Electrical "Divining Rod."

Telephone men are using divining rods, according to an article recently published in the Telephone Review. They are not the old-fashioned forked sticks used to detect springs under the surface of the earth, but pieces of mechanism for locating gas pipes in the streets and submarine cables.

The new divining rod is very simple, resembling a wheel suspended on wires and built on the principle of the microphone. More technically described, it is a small, compact, two-stage amplifier used with a special exploring coil and an ordinary induction, or No. 20-A test set.

"Such an outfit," says H. M. Benham, construction supervisor of the New Jersey division of the New York Telephone Co., "has enabled us to trace the routing of each of two large, loaded duplex submarine cables crossing Raritan Bay from Annadale, Staten Island, to Keansburg, N. J. Each cable can be located within a strip five feet wide in water as deep as 50 feet.

"This is of great value when it becomes necessary to pick up either cable, as it makes it possible to avoid useless dragging with grappling hooks.

"This apparatus has been used in a number of cases to facilitate locating submarine cables at crossings where dredging work is to be done. In cases of buried cables of questionable routing, the cables can be easily and accurately traced by means of it, thus eliminating random digging.

"When the trenching machine is used in building a subway, the cutting wheel must be raised at each pipe crossing the trench line, to avoid damaging either the pipe or the trencher. The induction set and amplifier locate all such crossings very accurately so that they may be staked out in advance of trenching work.

"Frequently subsidiary branches in iron pipes, and occasionally sections of main subway in iron pipes are crossed by gas or water pipes or by the cables of some foreign company and contacts exist which allow current to flow to our underground plant, endangering it by action. Such contacts are easily located by determining the intersection of the line of the pipe with the line of our cable. The contact is then cleared by digging at that point."

No Laughing on Part of British Operators When on Duty.

Medical opinion as to the fitness of a telephonist at the British exchanges is threatened by the telephone authorities if an operator so far forgets herself as to laugh while on duty. The official pronouncement comes as a sequel to the case at a North-London telephone exchange where a girl in charge of a record circuit "laughed outright in a very loud manner."

An official notice was served on the operator to the effect that if she cannot keep her feelings under proper control, the question of seeking medical opinion as to her fitness will be considered.

The official charge was that the operator's laughter "diverted the attention of all the record operators from their work." The operators of the record department resent the attitude of the telephone officials, inasmuch as the operator in question "is a very quiet and inoffensive girl."

The offending operator replied to the "warning" of the authorities as follows: "Noted. I beg to ask, however, if I am to understand that the superintendent entertains any doubt as to my mental stability."

The reply, full of official dignity, was: "You have no right to put such a question to your superintendent."

Confirm Tri-State and Bell Rates

Minnesota Commission Orders Present Rates Resulting from Federal Court Injunction to Continue—Apportionment of Revenue and Expense Between Toll and Local Exchanges to Be Determined After Conference

On April 29, the Minnesota Railroad & Warehouse Commission issued orders in its investigation of the rates, tolls, charges, rules and regulations of the Tri-State Telephone & Telegraph Co. and the Northwestern Bell Telephone Co., confirming the toll and local exchange rates of the companies now in effect in Minnesota. These rates are, however, subject to modification as to specific classification or specific exchanges, upon application or complaint, or the further order of the commission.

The companies are ordered to file with the commission, within 90 days from April 29, statements of the operating revenues and expenses of their toll and exchange business separately for each local exchange in Minnesota, for the nine-month period beginning April 1 and ending December 31, 1921, and thereafter annually for each calendar year, and at such other times and for such periods as the commission may from time to time require.

The allocation and apportionment of the revenue and expense accounts and the reports are to be in such manner and form as determined by the telephone and statistical department of the commission after conferences with the representatives of the company.

Commissioner O. P. D. Jacobson, the order states, is not ready at this time to agree to the making of any order until the determination of the cases in the federal courts.

On December 1, 1920, the two companies filed petitions requesting a commission to authorize an increase in their gross revenues, the Tri-State asking for $1,544,022, and the Northwestern Bell for $2,945,575. These applications were denied by the commission's order of February 9, 1921.

On March 5, 1921, the companies filed bills of complaint in the United States District Court alleging the then existing rates to be confiscatory and applied for orders enjoining the commission from interfering with the placing in effect of local exchange and toll rate schedules made a part of the complaints, which would increase the revenues of the Tri-State $980,500 and the Northwestern Bell $2,174,635.

The court granted temporary restraining orders on March 17, 1921, followed by an interlocutory injunction dated July 21, 1921, restraining the commission from enforcing, or attempting to enforce the schedules of rates theretofore prescribed by it.

Increased local exchange and toll rate schedules were placed in effect as of April 1, 1921, producing an increase in the operating revenues of the Tri-State company within the state of Minnesota of approximately $752,550 per annum, and of the Northwestern Bell of approximately $1,183,453. The schedule so authorized by the court orders have since been and now are in operation.

PURE INTELLECT.

On pure intellect you can't go very far; a corporation operated on intellect alone is pretty apt to have friction. There must be a humanizing quality along with it. And that must be considered in handling and selecting men. There are some who are weak and some who are strong, and we must get at the good in all of them. But by sympathy in business, I do not mean that we must be soft. No—just human. A man may help or be helped; he may fit perfectly in some position and be weak in another. It used to be easier to fire a man than to try to fit him in. Today we go at it the humane way.—Samuel McRoberts, president, Metropolitan Trust Co.

During the hearings much evidence was introduced tending to show that an annual net income of 10 per cent on the fair values of the properties is necessary if the companies are to function properly as public utilities and be enabled to finance additions and betterments to the properties as public requirements demand. The Northwestern Bell Telephone Co. has since financed a considerable loan at an approximate cost of 8 per cent and the indications are that money can now be obtained at a somewhat lower figure.

Based upon the revenue from the rates placed in effect under the court order for the year 1921, the gross revenues of the Tri-State company amount to $4,339,014. The operating expenses for the year 1921, including allowances for depreciation at the reasonable rate of 5 per cent, amount to $3,425,148, with adjustment in taxes at the existing rate of 4 per cent upon the gross earnings, leaving a net income of $913,866, amounting to a return of 6.16 per cent upon the fair value of the property corrected to December 31, 1921, based upon the commision's order of January 20, 1922, available for interest, dividends and surplus.

The gross revenues from the rates placed in effect by the Northwestern Bell for the year 1921, amount to $8,665,612.55. The operating expenses for the year 1921, including allowances for depreciation at the reasonable rate of 5 per cent, amount to $6,942,668, with gross earnings, leaving a net income of $1,722,944, amounting to a return of 5.85 per cent upon the fair value of the property corrected to December 31, 1921, based upon the commission's order of January 20, 1922, available for interest, dividends and surplus.

"Labor and material costs have been on a downward trend for some time past," says the commission, "and these factors, together with constantly increasing efficiency in the operating forces, have resulted in a reduction of the operating costs, and it is fair to assume, will continue to decrease, with a resultant improvement in net income."

Subsequent to the issuance by the commission of its valuation order on January 20, 1922, the companies applied to the United States District Court for leave to file supplementary complaints in the proceedings then pending against the commission. On January 30, 1922, the court granted the Tri-State company permission so to do, and it was served upon the commission the same day. The Northwestern Bell was given permission to file a supplementary compaint on March 4 and it was served on the commission on March 16.

In the Tri-State's supplemental complaint it is alleged that the commission on January 20, 1922, filed its determination as to the fair and reasonable value of the company's property, wherein it was stated and found that such value was the sum of $14,330,169.21, but that the commission disregarded the various elements, and that the reasonable fair value of its property should have been found to be and is at least the sum of $20,144,407.88.

The company asked the district court to set aside the commission's valuation order on the ground that it is below the true value of the property, and further asked that the commission be restrained from taking any action to enforce the provisions of its order or instituting any proceeding to establish any rate or charge to be made by said company for its intrastate telephone service in Minnesota, based upon the valuation of its property as so fixed by the order of the commission.

The Northwestern Bell company declared in its supplementary complaint that the reasonable fair value of its property should have been found to be at least $35,000,000 by the commission instead of $27,683,744.

These proceedings are still pending in the United States District Court and the

Plant for treating cross-arms by the hot and cooling process. Note rack of cross-arms draining after treatment.

Another step forward— *Carbosoted cross-arms*

In the furthering of pole conservation, Carbosota has led the way. Today no one questions the economic value of butt-treatment of cedar poles. Full value from pole treatment is not secured, however, when the cross-arms decay and have to be replaced, within the life of the treated pole.

And the cost of carbosoting cross-arms is so small —only about 1½ cents per lineal foot—that it is false economy not to treat them and thus equalize their life with the life of the treated pole.

The above illustration shows the simplicity of carbosoting Douglas Fir cross-arms. A charge of cross-arms, in a special rack, is submerged in a treating tank containing Carbosota. Heat is then applied by means of live steam coils in the bottom of the tank. (If steam is not available, a fire under the tank will answer the purpose.) When the Carbosota reaches a maximum temperature of 215° F. the heat is turned off and the contents permitted to cool to atmospheric temperature (between 100° F. and 50° F.). The cross-arms may then be removed.

It is as you see a simple process which can be attended to by the regular line crew, as one charge per day is usually sufficient.

(*Poles should be thoroughly seasoned, especially when surface treatments are to be applied, and the portions to be treated carefully cleaned of all adhering inner bark.*)

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commission had until May 1 to make answer.

"The enactment of laws affecting telephone companies," the commission says in its orders, "has had considerable to do with the present increased rates."

The raising of the gross earnings' tax from 3 to 4 per cent has added a burden of approximately $42,371 per annum to the public for telephone service of the Tri-State company, and $86,390 for that of the Northwestern Bell.

"The eight-hour law, the minimum wage law and the compensation insurance law have all had their direct effect and also their indirect effect through the increased cost of materials and supplies," the commission states, "but in view of the reductions in costs already accomplished and the probable future reductions, the commission does not feel warranted in sanctioning an increase in the rates now being charged. The commission believes that with such reduction in costs and possible future economies in operation, the toll and exchange rates now in effect will yield sufficient revenue to provide for the necessary operating expenses, depreciation and a reasonable return upon a fair value of the property, as found in the commission's order issued on January 20, 1922.

"The commission, in this proceeding, does not pass upon the reasonableness of all rates in and of themselves, and believes that it can so pass upon the rates of individual exchanges or special classes of service to better advantage by special complaint by interested parties or by the commission on its own motion; and the order herein should be entered subject to modification as to specific classifications, rates and exchanges upon complaint of interested parties, or the initiation of the commission if further investigation so warrants."

Commissions, Courts and Councils

Discussion and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Court Commissioner Upholds Company's Contentions.

The Southwestern Bell Telephone Co., on April 25, was upheld by the commissioner of the Shawnee County district court in all of its contentions against an order of the Kansas Public Utilities Commission.

The company went into the district court and obtained injunctions against the public utilities commission to prevent the commission from interfering with telephone rates at Arkansas City, Atchison, Eldorado, Hutchinson, Winfield, Lyons and Great Bend, Kans. The Shawnee County court appointed George McDermott as commissioner to take evidence.

On every point the telephone company was upheld and the utilities commission was defeated. The commissioner in his findings gives the company practically everything it asked for.

One interesting feature of Commissioner McDermott's report was the statement that Kansas practically has tied the hands of its commission by pinching the appropriations for that department. It was pointed out by the commissioner that the telephone company had 45 engineers and accountants engaged continuously for 71 days in preparing the case for the company, while the utilities commission, representing the public, had only seven men, and some of them were employed part of the time in other necessary work. It is said the Bell company spent $100,000 in preparation for the suit.

The commissioner found little of use in the evidence of the public utilities commission, while he found nearly everything which the telephone company submitted to be "reasonable," and these were adopted as the standard by the commissioner and used as a basis for upholding the rates desired by the telephone company.

The public utilities commission does not intend to let the matter end with the report of the commissioner, which declared every order the commission made in seven towns illegal. The utilities commission will fight when the report of the commissioner comes up for final hearing in the district court, and it announced that it would take the case to the state supreme court if the Shawnee County court sustained the report of the commissioner. The report of Commissioner McDermott was termed "amazing" by Clyde M. Reed, chairman of the public utilities commission.

Indiana Independent to Purchase Competing County Properties.

The Indiana Public Service Commission has approved a contract whereby the Princeton Telephone Co. may buy the Oakland City Telephone Co. and the Indiana Bell Telephone Co.'s properties in Gibson county. The commission is to appraise the properties and the sale is to be made on that basis, with the payments in stock, par value, of the Princeton company. Gross estimates of the properties range around $50,000.

The order, which was written by Carl Wilde, an examiner for the commission, said the three companies have been duplicating service.

Same Rates Effective in Kansas City, Kans., as in Kansas City, Mo.

The Kansas Public Utilities Commission, on April 20, handed down an order authorizing the Kansas City Telephone Co. to put into effect on May 1 the same rates in Kansas City, Kans., as have existed in Kansas City, Mo., since February 1.

Kansas City, Mo., and Kansas City, Kans., are, of course, in reality one city. The state line is simply an imaginary line, the middle of a street which extends for nearly the entire distance. In the building of the Kansas City Telephone Co.'s property, for plant reasons, many Kansas side patrons were furnished service from Missouri exchanges, and vice versa. The need of the two communities for uniform service has long been recognized.

Application for the increase on the Kansas side was filed last September, but was not set down for hearing until January 25. It was then postponed to February 6 and later to March 13. Hearings were held on March 13 and 14 and the order issued, as stated above, April 20.

The Kansas commission took up with the Missouri commission the question of joint hearings on the question of rates and obtained a statement from the Missouri commission that that body would be glad to consider matters jointly in the future if it was found advisable.

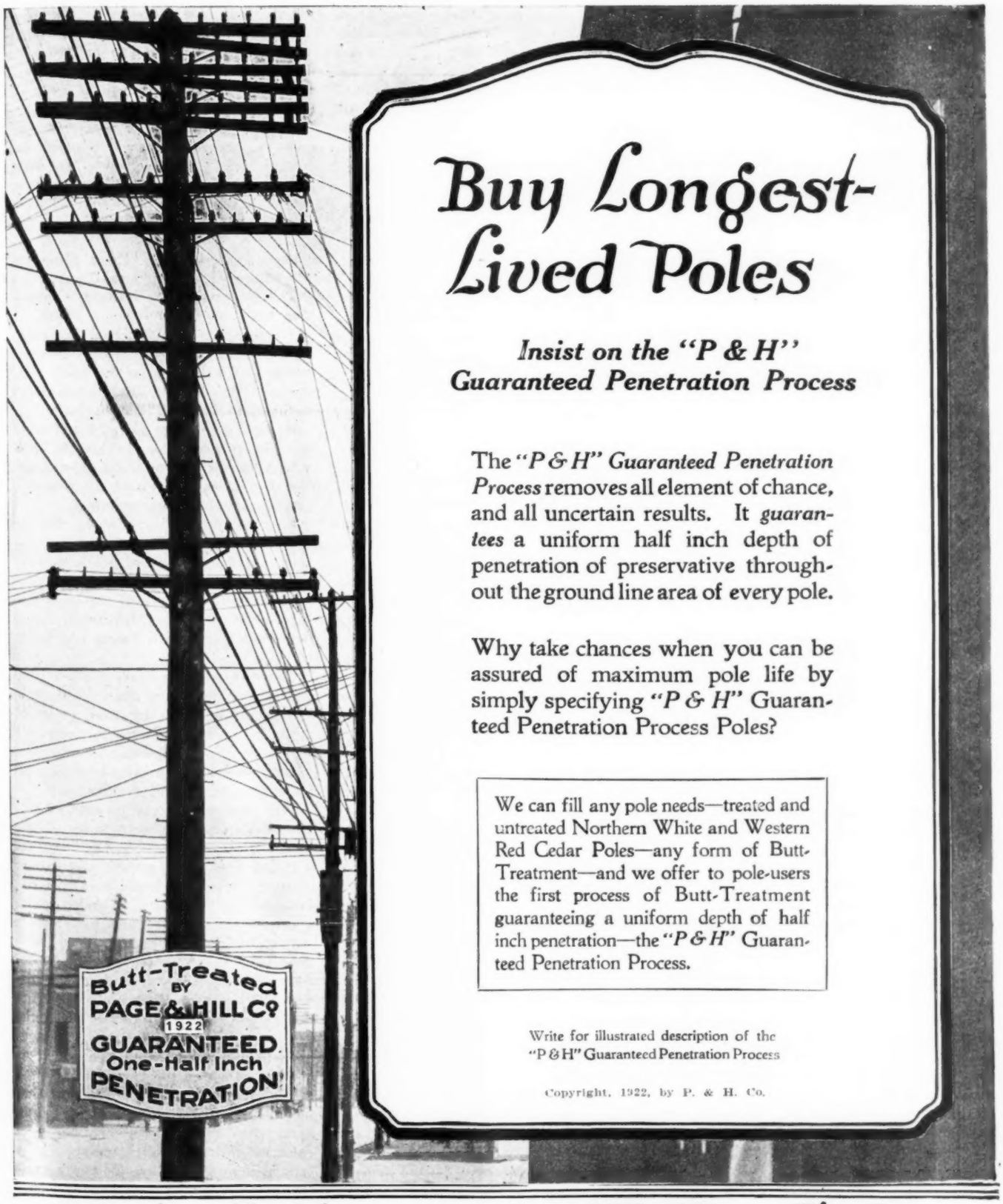
The order handed down by the Kansas commission grants the rates for a six months' period at which time further hearings will be held on the question of the valuation of the entire property.

An editorial from the Kansas City Times states that it was announced that the increase was granted in Kansas City, Kans., at the suggestion of the business interests of the city, based upon the fear that to continue the low rate in Kansas would result in toll line connections between the two cities.

The determination of the two commissions to act jointly on the problems of rate making for Kansas City is hailed with enthusiasm by the press, which holds this the proper course to pursue. The action of the two commissions in the determination to treat the two cities as one means a long step in wiping out the handicap of the state line, which is an obstacle to unified interests.

Service Consolidation of Michigan State and Valley Home, July 1.

Properties of the Valley Home Telephone Co., of Saginaw, Mich., and surrounding territory, were turned over to



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the Michigan State Telephone Co., Monday morning, May 1.

Deeds to the property were turned over at that time and the few remaining formalities completed. It was expected that the Bell would make its initial payment of between $900,000 and $950,000 on that date.

Completion of the deal will mean that the service consolidation probably will take place July 1. Commercial Superintendent A. E. Huntley, of the Bell company, said, though there is a possibility that the work necessary to bring about the consolidation may be completed a few days earlier.

A supplemental agreement has been reached by the Bell and Valley covering the basis on which the damage to the Valley properties caused by the three recent sleet storms has been made. This agreement also covers other minor points which have arisen since the original agreement was made.

The work of connecting the properties of the two companies to make the unified service possible will be started immediately. The consolidated directory is nearly all compiled and this will be issued in time to be distributed a few days before the consolidation of service.

Missouri Companies Permitted to Continue Increased Rates.

The Missouri Public Service Commission, under date of April 17, entered orders allowing the present schedules of rates to be continued by the Butler Telephone Co., formerly the Butler Rich Hill Telephone Co., of Butler; Hamilton Telephone Co., of Hamilton, between Hamilton and Breckenridge and Hamilton and Gallatin; Jasper Telephone Co., of Jasper; Platte County Telephone Co., of Platte City; Thos. J. Davis Telephone Lines, for the vicinity of Napton.

Similar orders were entered on April 21 and 27 for the Willow Springs Local & Long Distance Telephone Co., of Willow Springs, and the Home Telephone Co., of Joplin.

These rates were established about a year ago, and the commission now finds that the revenues obtained as a result of the increased rates have not been sufficient to pay an unusual return on the investment. The schedule as approved is to continue until altered by the commission.

Substantial Increase Allowed by Minnesota Commission.

Being of the opinion that the rates asked for by the Redwood Falls Electric Telephone Co., of Redwood Falls, Minn., were so high they would curtail rather than develop the telephone business in that city, the railroad and warehouse commission, on April 29, authorized a modified schedule of advanced rates to be placed in effect May 1.

The Redwood Falls Electric Telephone Co. owns a local automatic telephone exchange at Redwood Falls, serving about 600 business and residence stations within the city. It connects with the switchboard of the Redwood County Rural Telephone Co. by means of automatic trunks, and connections are established with the toll office of the Tri-State Telephone & Telegraph Co. by the use of automatic trunks.

In 1921 the company constructed a modern brick building, in which an automatic exchange was installed, and it replaced aerial cable with underground cable. A portion of the old aerial wire construction was also replaced with aerial cable, so that at the present time the Redwood Falls Electric Telephone Co. has one of the most modern exchanges in the state.

While denying the rates asked for, a substantial increase was granted, as the following comparison shows:

Business	Old.	New.
One-party	$2.50	$3.25
One-party (North Redwood)	....	3.75
Two-party (North Redwood)	....	2.75
Residence		
One-party	1.50	1.75
Two-party	1.25	1.50
Two-party (North Redwood)	....	1.75
Business extension	.50	1.00
Residence extension	.50	.50

Nebraska Hotel Men Protest Increase in Bell Rates.

The Nebraska Hotel Owners Association has joined with other protestants in objecting to any further increase in the rates charged by the Northwestern Bell Telephone Co. In a letter to the state commission, it insists that the telephone companies shall join with other businesses in meeting the public demand for lower prices.

Particular objection is also lodged with respect to the company's insistence that out of the five cents collected for local calls from hotels, the company be given 3¾ cents. At present it gets half, and the hotel owners say the half they get does not nearly pay the cost of supervision. The company has suggested a ten-cent charge, but the hotel men say that the public will resent this sum, and that they will be the ones who will have to listen to the kicks and get the blame, not the telephone men.

Takes Damage Suit to State Supreme Court.

The Lincoln Telephone & Telegraph Co. has appealed to the Nebraska Supreme court from a judgment in the Lincoln courts ordering it to pay $7,500 to the heirs of a lineman employed by the local electric light company, who died from injuries received when a rotten telephone pole he had climbed broke under him.

It is a hard-luck tale the Lincoln company tells the supreme court. It says that the pole was located in a remote part of the city and had been abandoned by it, when along came the electric light company and without asking permission put its own wires thereon and proceeded to use it.

The telephone company never knew of this usurpation until after the accident. Now it is hit for $7,500 because a man sent by the light company to repair the wires on the pole was injured. The light company has been paying compensation, which will total less than the judgment against the telephone company.

Transmission Line Case Goes to Nebraska Supreme Court.

The Nebraska State Railway Commission has refused to rescind its recent order denying to a transmission line equal rights on the highways with wire companies that were first on the road. The towns of Maxwell and Brady voted money to build to North Platte to get a line carrying high voltage currents, and when the wire companies on the Lincoln highway, where it was proposed to run, objected the commission said the transmission company must go elsewhere.

The towns have appealed to the supreme court, claiming that the commission is without power to give any other wire companies a monopoly of any highway. It asks an order of the court that it be permitted to use this highway rather than the longer one the commission told it to build upon.

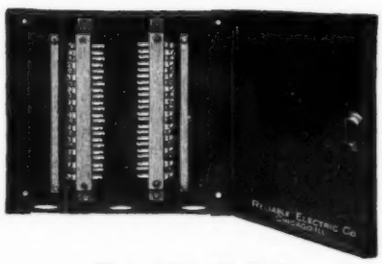
The wire companies have avoided, until the present time, any test of the legal proposition involved, by making agreements with the small power companies that have been gridironing central Nebraska, whereby the heavier lines were all placed on one side of the road and the lighter ones on the opposite side, or else have induced the power companies to take other highways.

It has been felt, however, that sooner or later the question would have to be adjudicated by the courts. The legislature grants to cities and villages the right to acquire and operate electric transmission lines to secure a power generated elsewhere, and has given the railway commission the power to regulate the construction of lines where any conflict may exist between power and signal lines. Voltages have been increased until they reach as high as 66,000 on the longer lines.

The difficulty arises from the fact that the telephone lines having been built first, have taken the shortest lines between cities and towns, and their managers have been insisting that, where the power companies will not take special care in construction, they must take other and longer roads. The power companies have resented this effort to bar them from public highways, and with their growth and increase in number, the question of subsequent rights has been pushed to the front.

It is contended by the attorneys for the villages of Maxwell and Brady that arbi-

Steel Building Boxes for Telephone Distribution

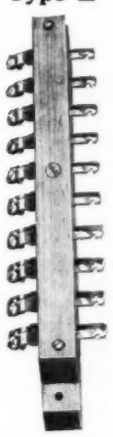


Type E—22 Pair

Cable Wires Soldered

Telephone Wires Under Binding Posts

Type E



Equipped with treated maple strips with tinned brass connectors driven through holes in maple.

Type E Building Terminal

Capacity	Dimensions	Net Wt.
11 pairs	11¾ x 10¼ x 2⅝	7 lbs.
22 "	11¾ x 10¼ x 2⅝	7¼ "
26 "	11¾ x 14¼ x 2⅝	9¼ "
30 "	11¾ x 14¼ x 2⅝	10 "
52 "	11¾ x 20¼ x 2⅝	13¼ "
100 "	11¾ x 40½ x 3⅛	25 "
200 "	13¾ x 81 x 3⅛	50 "

Type L Building Terminal

Capacity	Dimensions	Net Wt.
11 pair:	11¾ x 10¼ x 2⅝	7¼ lbs.
16 "	11¾ x 14¼ x 2⅝	9¼ "
26 "	11¾ x 20¼ x 2⅝	13¼ "

Type L

Equipped with milled hard rubber strips, with brass connector bolted in place.

Use Type EC Building Terminals for cross-connecting building cables.

Permits full use of both inside and outside cables.

Locates trouble in or out.

Is exactly like the Type E, with jumper rings and space at top and bottom for running jumper wires.

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trary action on the part of either the legislature or the commission is repugnant to the constitution of the state, and that there can be no such thing as acquiring a monopoly of the public highway system by prior occupancy where later public utilities of equal importance to the communities connected by the highways desire to use them.

Bell and Western Electric Before New York Commission.

The relationship between the Western Electric Co. and the associated companies of the Bell telephone system was explained April 24 in the New York Public Service Commission's inquiry into the state-wide affairs of the New York Telephone Co. by Edward V. Cox, supply contract auditor for the American Telephone & Telegraph Co.

The Western Electric Co., the witness said, supplied telephone apparatus and acted as purchasing agent for the Bell companies, although these companies were not required to make purchases from the electric company if they could secure better prices elsewhere. In recent years, he continued, the Western Electric Co.'s prices to the Bell telephone companies not only were about 15 per cent cheaper than current prices charged by other concerns, but also were considerably lower to the Bell companies than to other telephone companies.

Some years ago, Mr. Cox declared, the Bell telephone companies asked the Western Electric Co. to take over their supply and purchasing functions. Up to that time these companies had been competing against each other, with consequent boosting of prices. The purchasing functions, the witness continued, were performed by the electric company on a flexible percentage basis, changeable as conditions required, but were not profitable in themselves to the electric company. It was done, he declared, in the interests of better and cheaper telephone service.

As a result of the manufacturing arrangement with the Western Electric Co., he said, the telephone companies were assured of an adequate supply of standard high-grade apparatus at reasonable terms, which could not be secured for the same prices under any other arrangement.

The witness said that the Western Electric Co. was also engaged in a general manufacturing business, dealing in electrical supplies and selling to the general trade. In 1920, 55 per cent of its sales were to Bell system companies, while 45 per cent were to other concerns.

Assistant Corporation Counsel Fortig asked about the commissions received by the electric company, and the witness displayed the supply contract which showed that the commission ranged from 1 per cent on directories shipped direct to the telephone company, to 15 per cent on stationery and office supplies shipped from the electric company's storerooms.

The contract also revealed that the electric company buys the coal for the New York Telephone Co. on a commission basis of 3 per cent when delivered direct and an additional commission when it is stored awaiting orders.

Replying to a question by Deputy Attorney General Fennell, the witness said that the Western Electric Co. made a profit of 7.2 per cent in 1920 chiefly out of its own product, and explained that the prices charged to associated telephone companies were different from those charged the general trade. The increase to the latter, he stated, ran from 18 to 100 per cent.

J. S. Wiley, general auditor of the New York Telephone Co., testified that the interest rate on the $27,000,000 lent the company by the American Telephone & Telegraph Co., was 6 per cent, which a slight discount reduced to 5.88 per cent.

On April 25 two witnesses testified concerning the company's toll and long distance telephone business in New York state.

W. A. Bentley, assistant to the president, and F. H. Fuller, rate engineer of the telephone company, explained that the American Telephone & Telegraph Co. received revenue only for toll calls handled over the American lines, and that the bulk of the toll business in New York state was handled over the New York Telephone Co.'s lines. In 1921, Mr. Bentley showed, the New York Telephone Co. handled 80,466,000 toll calls in New York state which produced a revenue of more than $13,000,000.

Furnishes Rural Service Above the Average—Rates Increased.

A decision was rendered by the Wisconsin Railroad Commission on April 1 authorizing the Clinton Telephone Co., of Clinton, to increase its rates for telephone service. The old and new monthly rates are as follows:

	Old	New
Business, one-party	$2.25	$3.00
Business, two-party	2.00	2.50
Residence, one-party	1.25	1.75
Residence, two-party	1.00	1.50
Residence, four-party	1.00	1.25
Rural, eight-party selective	1.75	2.00
Rural, twelve-p'ty line bridged	1.50	1.75

The company operates an exchange in the village of Clinton serving a total of 544 subscribers, classified as: 47 business, 222 residence, and 275 rural. Magneto service is furnished to both local and rural subscribers. All lines are full metallic and in no instance does the number of subscribers on a rural line exceed 12.

The semi-selective service offered to rural subscribers restricts the number per line to 8 or less and the number of incoming rings on any instrument to 2. The commission found that the character of the service rendered to the rural subscribers was above the average.

The company's property consists of an exchange building with land, a 300-line magneto board, 106 miles of pole line, 567 miles of iron wire, 9,883 feet of various sized cables, and the necessary instruments and appurtenances to serve its subscribers. The commission found the reproduction cost of the company's property and plant to be $44,728.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

April 24: Pacific Telephone & Telegraph Co. given authority to issue and sell for cash at not less than $83 per share, 250,000 shares (par value $25,000,000) of 6 per cent cumulative preferred stock. The proceeds are to be used to pay an indebtedness due the American Telephone & Telegraph Co., the Crocker National Bank and other obligations.

April 24: Complaint filed by R. E. Cotter and Charles E. Huddart in which they allege they have been unable to secure service from the Pacific Telephone & Telegraph Co. Cotter says he is a canned goods broker and Huddart gives his business as a lumberman. They ask for an order compelling the telephone company to install telephones at 747 and 770 Rosemount Road, Oakland.

April 27: Application filed by Pacific Telephone & Telegraph Co. for authority to issue and sell $25,000,000 5 per cent bonds at not less than 91 per cent of their par value.

ILLINOIS.

May 3: Hearing at Springfield in citation that Union Telephone Co., of Chatham, show cause in matter of violation of rules 4, 5, 6 and 21 of General Order 65, establishing standards of service for electric utilities in Chatham.

May 3: Hearing at Springfield on joint application of Illinois Bell Telephone Co. and Home Telephone Co. of Cairo for an order consenting to purchase and sale of property of the Home Telephone Co. of Cairo and all farmer and toll lines connected therewith; also the assumption by Illinois Bell Telephone Co. of $37,500 outstanding mortgage bonds.

May 3: Hearing at Springfield on application of Illinois Bell Telephone Co. for certificate of convenience and necessity to operate exchanges in cities of Mounds and Mound City.

May 4: Hearing at Salem on application of Commercial Telephone & Telegraph Co., of Olney, for advanced rates in Aviston, Beckemeyer, Breese, Carlyle, Germantown, Salem, Trenton, Flora, Mt. Carmel and Olney.

May 5: Hearing at Springfield on rate increase proposed by Murphysboro Telephone Co. for service in Murphysboro and 23 other municipalities.

May 9: Hearing at Chicago in matter of rate reduction in counties of Cook, Du Page, Grundy, Kane, Kendall, Lake, McHenry and Will.

INDIANA.

April: Reduction of 25 cents a month for all subscribers of the Farmers & Merchants' Co-operative Telephone Co., of Boswell, proposed in a petition filed by the company with the commission.

KANSAS.

April 8: Moran Telephone Co. given authority to sell its plant and property at Moran to C. L. Cummings and Florence E. Cummings.

April 15: Certificate for issuance of $50,000 of its capital stock granted Herrington Co-operative Telephone Co.

April 20: Temporary increase in rates,

Can you use 8,800 Miles of Telephone Wire?

All this wire is in fine condition and ready for immediate removal from the War Department warehouses.

This announcement points the way to the best wire buy ever offered you

WHATEVER your requirements in the way of quantity, they can be met and met at once.

The War Department has 8,800 miles of No. 14 B & S gauge, S. and D. C. rubber insulated, outside twisted pair, copper wire at New Cumberland, Pa., for sale. This wire is in excellent condition. It will be sold at your figure, if that figure sounds reasonable.

Talk it over with the War Department.

For details concerning this wire, or for negotiation relative to purchase, write, telegraph or visit in person,

Lt. Col. Frank J. Griffin, S. C.,
Office, Chief Signal Officer,
Room 3415 Munitions Bldg.,
Washington, D. C.

WAR DEPARTMENT

beginning May 1 and continuing for six months, for service in and about Kansas City and Rosedale, allowed to Kansas City Telephone Co. The new rates are the same as those allowed by the Missouri commission for Kansas City, Mo.

MINNESOTA.

April 20: Orders entered confirming toll and local rates now in effect in Minnesota by Tri-State Telephone & Telegraph Co. and Northwestern Bell Telephone Co.

April 29: Rates of Redwood Falls Electric Telephone Co., of Redwood Falls, substantially increased.

MISSOURI.

April 21: Order entered continuing increased rate schedule of Willow Springs Local & Long Distance Telephone Co., of Willow Springs.

April 25: Advanced rates which were temporarily granted Huntsville Telephone Co., of Huntsville, on December 27, 1921, continued, with provision that report be filed before August 1, 1922, showing progress of certain improvements ordered December 27, 1921.

April 26: Order entered in matter of Centralia Central Farm Club against Home Telephone Co., of Centralia, reducing rural Class B rates from $18.00 to $15.00 a year.

April 27: Home Telephone Co., of Joplin, authorized to continue using schedule of increased rates grapted March 22, 1921.

April 27: Effective date of proposed increased rates of Jonesburg Telephone Co., of Jonesburg, postponed to August 28, 1922, to give commission an opportunity to investigate complaints of subscribers as to service.

NEBRASKA.

April 22: Application of citizens of Hampton for order consolidating the exchanges there of the Hamilton county and Lincoln companies dismissed for want of jurisdiction.

April 24: Application of the Oconto Telephone Co., of Oconto, for permission to increase rates granted on condition that new switchboard be installed.

April 24: Application filed by the Lincoln Telephone & Telegraph Co. for approval of amended contract of application for service.

April 25: Application of the Monroe Telephone Co., of Lincoln, for permission to eliminate all free service and to substitute toll charges withdrawn.

April 25: Complaint filed by J. F. Bezot, of Long Pine, alleging that the Northwestern Bell company is making a double charge for switching two farm lines.

April 26: Application filed by the Platte County Telephone Co., of Columbus, for permission to increase all rates 10 per cent to make good storm damage losses.

April 26: Complaint filed by L. E. Jackson, of Neligh, alleging improper collection of toll charges by Antelope County Mutual Telephone Co., of Elgin.

April 27: Hearing at Indianola on service complaint against the Havana Telephone Co., of Indianola; evidence taken and matter submitted.

May 1: Hearing resumed upon application of Northwestern Bell Telephone Co. for increase of rates, further evidence taken with reference to contracts with American Telephone & Telegraph Co. and Western Electric Co. Continuance taken until May 22, at which time the commission will take up showings of respective complainants.

April 27: Objections filed by Nebraska Hotel Owners Association relating to proposed increase of Northwestern Bell rates and to division of revenues on local calls.

NEW YORK.

May 1: Hearing at New York City on petition of New York Telephone Co. for increased rates in New York City.

May 2: Hearing at New York City in state-wide rate case of New York Telephone Co.

May 3: Hearing at Albany on application of Rochester Telephone Corp., of Rochester, for certificate of public convenience and necessity of construction; and as to issuing stock, mortgage, mortgage bonds and an agreement as to notes; and joint petition of Rochester Telephone Corp., Rochester Telephone Co. and New York Telephone Co. as to transfer of local franchises from last two companies to the Rochester Telephone Corp.; also supplemental petition.

NORTH DAKOTA.

April 25: Matter of switching rates charged by the Oliver Mercer Telephone Co., of Center, at its Center exchange, reopened for further investigation upon complaint of service companies.

April 25: Application filed by Peoples Telephone Co., of Taylor, for authority to reduce the hours of telephone service at Taylor and Richardton.

April 25: Application filed by Griggs County Telephone Co. and Washburn Township Mutual Telephone Co., both of Cooperstown, for certificate of convenience and necessity to purchase and sell a certain rural telephone line.

SOUTH DAKOTA.

April 21: Rate increase of $3 per year granted Farmers Western Telephone Co., of Ethan. No dividends to be paid until property is rehabilitated.

WISCONSIN.

April 22: In the case entitled "Trego Telephone Co. vs. Earl Telephone Co. U-2626" the commission found that, while the respondent did violate chapter 610, laws of 1913, by unlawfully extending its lines for local service in the town of Spring Brook, Washburn county, without first complying with the provisions of said chapter, public convenience and necessity required the construction and operation of the lines by the Earl Telephone Co.

April 22: Decision rendered in the matter of the investigation on motion of the commission of the proposed extensions of the Eastern Wisconsin Telephone Co., of Chilton, and the Rockland Telephone Co., of Reedsville, in the towns of Rantoul and Charlestown in Calumet county. Since this action was started, the Rockland Telephone Co. changed its name to the Rantoul Telephone Co. The decision found that the majority of the persons to be served had a preference to be connected to the Potter exchange of the Rantoul Telephone Co. That company was, therefore, authorized to extend its lines and render the local service to the various subscribers.

April 24: Application of the Rock County Telephone Co., of Janesville, for authority to increase its rates, denied. Subsequent to the hearing in this matter, the Wisconsin Telephone Co. purchased the property of the Rock County Telephone Co. In a formal proceeding brought before the commission, rates were authorized for the Wisconsin Telephone Co. covering the service after unification and consolidation of the two properties had taken place.

April 27: Application of Crawford-Vernon Telephone Co. for apportionment of upkeep of Liberty Pole Telephone Co., which is comprised of nine companies, according to subscribers directly connected, approved. Toll charges to be installed for non-subscribers of Liberty Pole Telephone Co., except in case of Crawford-Vernon company, which, by maintaining upkeep of lines betweeen Soldiers Grove and Liberty Pole, may have free service.

April 27: Petition of 40 citizens of Breed for service by Suring Telephone Co., of Suring, approved.

April 28: Wayside Telephone Co., of Wayside, given permission to issue $7,000 par value of its bonds, maturing serially, bearing interest at the rate of six per cent per annum, payable semi-annually, and secured by a mortgage or trust deed issued to Fred C. Teske, as trustee. The purpose for which the bonds are to be issued are to secure funds with which to pay for new construction and extensions to its lines, and all for purposes properly chargeable to capital account.

April 28: Tomah Electric & Telephone Co., of Tomah, authorized to issue $25,000 par value of its first mortgage gold bonds, dated April 1, 1922, maturing April 1, 1937, bearing interest at the rate of 6 per cent per annum and secured by a mortgage or trust deed issued to Frank H. Drew as trustee. The bonds are to be sold for money only and at not less than 90 per cent of the par value thereof. The funds derived therefrom are to be used to refund existing indebtedness and to pay for future additions and extensions to the company's property and plant, and all for purposes properly chargeable to capital account.

April 28: Authority to increase rates given Viroqua Telephone Co., of Viroqua.

May 5: Rehearing at Madison on application of Home Telephone Co., of Durand, for authority to increase its rates. U-2524, U-1875.

May 8: Hearing at Madison on application of Farmers Lake Shore Telephone, Traction & Electric Power Co., of Algoma, for rate advance. U-2690.

May 9: Hearing at Madison on petition for increased rates of Tamarack Telephone Co., of Arcadia. U-2693.

May 9: Hearing at Madison on application of Farmers Mutual Telephone Co., of Baraboo, for advanced rates. U-2694.

May 10: Hearing at Madison on application of Pine River Telephone Co., of Yuba, for increased rates. U-2695.

May 10: Hearing at Madison on petition of Lincoln Farmers Telephone Co., of Whitehall, for increased rates. U-2697.

May 11: Hearing at LaCrosse court house on rates, practices and services of La Crosse Telephone Co., of LaCrosse. U-2684.

May 12: Hearing at Prescott village hall on complaint of C. H. Hartman and others against Prescott Telephone Exchange, for reduction in rates. U-2656.

May 18: Hearing at Lancaster court house on petition of T. S. Metcalf and others that Farmers Telephone Co. of Beetown be ordered to restore Burton exchange. U-2688.

May: W. E. Bennett vs. St. Croix Telephone Co. and Wisconsin Telephone Co. in matter of joint use of poles; Commissioner Bryan will set date after receiving advice from parties. U-2677.

May: Fred V. Heinemann and others vs. Wisconsin Telephone Co. as to rates and practices in Greenville and Ellington. U-2692.

May: Village of Melrose vs. Wisconsin Telephone Co. in matter of removal of poles. U-2696.

Assure the Safety of Your Lineman

Why let him take unnecessary risks? Why let him take a chance when the work may be executed in perfect safety?

BUHRKE Safety Belts and Straps

are the best insurance policy you can invest in. They afford protection equivalent to four times any possible strain. Made of selected "steer" hides—all hardware tested—specially made for the purpose—no defects.

BUHRKE SAFETY BELT

Made by the only specialists in leather goods for electrical workers in the U. S. A.

R. H. BUHRKE CO.

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1238-1250 Fullerton Ave., Chicago

"THE HOUSE OF QUALITY"

BELTS BAGS STRAPS

The "Rimco" Rubber Insulated Screw Driver is indispensable to the telephone man who considers "safety first."

The insulation on this tool is semi-soft, not hard. Therefore, it will not crack or break when dropped on a hard surface or from the arm of a pole.

RUBBER TRADE RIMCO MARK PRODUCTS

Bond of uniting the rubber compound to the metal — the Elchemco process — makes a permanent attachment of the rubber to the metal, not to be confused with slip on handles of semi-soft rubber and other methods which are neither practical nor can withstand a test for dielectric strength after hard impact.

Passed for 5,000 volts at Electrical Testing Laboratories, Inc., New York City.

"RIMCO" Rubber Insulated PLIERS

RUBBER INSULATED METALS CORP.

50 Church St., New York City, U. S. A.

Distributed by Electrical and Hardware Jobbers
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DIAMOND EXPANSION BOLT Co

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MANUFACTURERS

Expansion Bolts — Drills
Screw Anchors — Toggle Bolts
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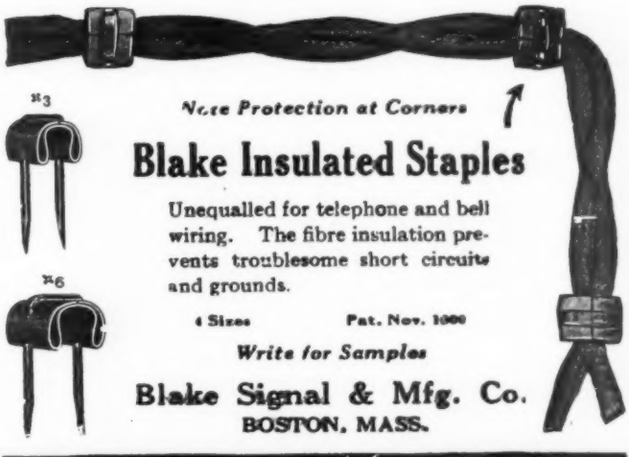


Note Protection at Corners

No 3

No 6

Blake Insulated Staples

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

4 Sizes Pat. Nov. 1900

Write for Samples

Blake Signal & Mfg. Co.

BOSTON, MASS.

ROEBLING

DOUBLE GALVANIZED

TELEPHONE WIRE

John A. Roebling's Sons Co., Trenton, N. J.

NORTHERN POLE and LUMBER COMPANY

POLE SERVICE

DULUTH MINNESOTA

Hot Galvanized Pole Line Hardware

M. LANZ BOLT CO. PITTSBURGH, PA.

NORTHERN **CEDAR POLES** WESTERN

BUTT-TREATING GUARANTEED GRADES

BELL LUMBER COMPANY, MINNEAPOLIS, MINN.

From Factory and Salesroom

Conventions: South Dakota, Mitchell, May 10-12; North Dakota, Mandan, June 6-8

All Telephone Men Know J. M. Lenz, the Cord Man.

J. M. Lenz, of the Runzel-Lenz Electric Mfg. Co., Chicago, has been identified with the telephone industry for many

"Mayo" Lenz Has Boosted Runzel-Lenz Cords for Years.

years, yet by glancing at the accompanying portrait, he is seen to be a young man yet.

"Mayo" Lenz is one of the most energetic men in the business. During his waking moments, when he isn't pushing the sale of Runzel-Lenz cords and cable, he is usually sitting behind the wheel of an automobile, for he is an ardent motorist—and often he combines the two. He is a member of the board of managers of the Olympia Fields Country Club, and is planning to join the tent colony there again this summer.

It is rumored that "Mayo" has challenged W. Roy McCanne, treasurer and general manager of the Stromberg-Carlson Telephone Mfg. Co., to a "home and home" series of gold matches this coming season.

Business Is Good in the Telephone Manufacturing Field.

About the first of the year the Monarch Telephone Mfg. Co., of Fort Dodge, Iowa, made the prediction that "in 1922 things will be looking up." With four months gone, this company makes the following comment, which is most pleasant to read:

"Our prediction, so far, has not only proved to be true, but has exceeded our expectations. The last month has been the most encouraging month in over two years. It is the first month since the crisis of 1920 when improvement has been uniform in practically all of the fundamentals which indicate the trend of purchasing power.

"Some increases in agricultural prices have helped the farmer. The strength in the bond market has stimulated new construction work. A great many telephone companies are placing their orders for spring construction material earlier this year than they have in previous years. This is one indication that confidence is again returning.

"Several nice switchboard contracts have recently been placed with us, and telephone orders for spring installation are increasing each day. These orders are forerunners of the business revival which will be in evidence next fall, and will continue through 1923."

New Leich Ringing and Charging Machine.

To meet the demands of telephone companies situated in cities having fire inspection, the Leich Electric Co. of Genoa, Ill., has recently developed a ringing and charging machine, fully enclosed in a steel cabinet, which has passed the National Board of Fire Underwriter's test and inspection.

The machine is equipped with duplicate mechanical rectifiers, controlled by individual switches. Either one or both rectifiers may be used for charging the storage batteries associated with the equipment. The rectifiers are equipped with new type vibrating units which it is stated will operate satisfactorily on power current that has a wide range of frequency and voltage. A magnetic locking device to cut battery off the line when power current fails is also incorporated in the equipment.

The field for such a machine is constantly widening, as it furnishes uninterrupted ringing current, current for operators' sets, for pilots and transfer lamps.

The steel cabinet should prove popular with operating companies on account of entirely enclosing the machine which makes it practically dustproof. It may be locked, thus preventing unauthorized persons starting it.

A new circular tells all about the Leich line of ringing equipment and may be had by writing the Leich Electric Co., Genoa, Ill.

Remarkable Radio Service at the Ritz-Carlton Hotel.

The Ritz-Carlton Hotel at Atlantic City, N. J., the newest of the remarkable group of hostelries operated by the Ritz-Carlton Co. throughout the world, is recognized as the acme in modern design and efficiency. Every possible device that can serve the convenience of the guests has been provided, and every refinement of service thought of.

One of the most interesting features is the powerful radio telephone equipment which has been installed on the hotel roof by direction of Albert Keller, managing director of the Ritz group. The wireless room has every facility and modern piece of apparatus.

The set comprises a tuner, detector and three-stage amplifier, one of the few of its kind in the country. It has both short and long-wave detectors, capable of receiving messages of wave lengths of from 125 meters to 20,000 meters. It is also equipped with a loud-talking device. The expert in charge, Ralph B. Parks, has had several years' experience.

In the Radio Room of the Ritz-Carlton Hotel at Atlantic City.

SERVICE GOVERNS RATES

The Lima Telephone and Telegraph Company secured an increase in rates in 1921 from the Ohio Public Utilities Commission mainly because of the superior service rendered by them.

In its findings the Commission stated: "The Commission would be most reluctant to grant any increase at this time in view of present day conditions were it not for the fact that testimony adduced at the hearings and the admission of counsel for the city conclusively discloses that *the service of the Lima Company is equal to, if not the most efficient and satisfactory of any telephone company in this country.*"

The Lima Company was enabled to give this service by installing the North Automanual Exchange System.

What the Automanual has done to better service and decrease operating costs in Lima and other cities it can do for you.

For full particulars as to North Automanual, Dial Automatic, or Satellite (remote control) Systems, write for Bulletin No. 1.

THE NORTH ELECTRIC MANUFACTURING CO.
GALION, OHIO

Save Your Old Poles Protect Your New Ones

Poles rotted at the ground line, or broken and about to fall, can be salvaged and made as strong as when first set by the simple installation of American Pole Protective Sleeves.

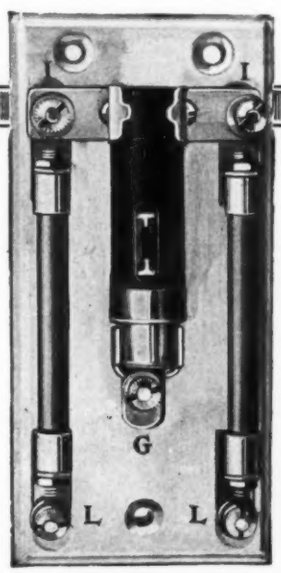
This device, made of Armco Ingot Iron, is placed about the base of the pole in two halves, locked together with a key strip and driven into the ground with a sledge, or with the American driving jack.

Poles reinforced in this way are as strong as a new pole, are unaffected by decay or attack by moisture at the ground line, and require no attention as long as the top of the pole is good for service.

The cost of renewing poles in this way is much less than the cost of setting a new pole, and the installation of this protector is insurance against fire and wind and ice storms.

Manufactured by
The American Rolling Mill Company
Middletown, Ohio

For full particulars and prices write to
AMERICAN POLE PROTECTIVE CO.
State Bank Building, Freeport, Illinois



Better than ever

Prices Lower than ever

BRACH VACUUM ARRESTERS

During the past year we have brought out several improved types for telephone protection and also brought prices within the reach of every company.

Take our new Type 440, for instance. It embodies all the advantages of BRACH Arresters—full protection against lightning, crosses, grounded lines—gives clear transmission and balance of potential between pairs.

Price complete with porcelain base, fuses and mountings —$1.50 each.

L. S. BRACH MFG. CO., Newark, N. J.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

The Ritz radio system, located approximately 400 feet above the Boardwalk, is one of the most powerful outfits of its kind in the country. The aerial is stretched across a space 35 feet above the roof of the hotel, which itself is the highest structure on the south Jersey coast. This station is capable of receiving radio telephone as well as telegraph messages from points on the Pacific coast, South America and Europe.

The Ritz-Carlton Hotel at Atlantic City, N. J., Gives Radio Communications to Guests Over Its P. A. X. System.

But one feature of the radio service offered by the Ritz-Carlton to its guests deserves special mention. In addition to the regular city and long distance telephone system installed throughout the hotel, a P. A. X. system (private automatic exchange) of 100-station capacity has been provided for the operation of the hotel, and all messages between the various departments are carried over these private wires.

In addition, a number of automatic telephones are installed in various public places such as the banquet room, grill room, main restaurant, smoking room, lobby, etc., and the guests, by dialing No. 80 from any of these stations, can listen-in directly on the radio messages. The system is so arranged that six or eight simultaneous calls can be handled to the radio room, each guest hearing everything received as clearly as though in the radio room itself.

Any guest desiring to hear the latest sport or market news, or to listen-in on an interesting public address, has only to step to one of the automatic telephones, remove the receiver, dial "80," and the message comes to him clearly and distinctly.

This is a very novel use of the P. A. X. equipment, which is being so widely installed throughout the country for special interior communication purposes, and the hotel management has received many compliments as to its convenience and efficiency.

Stromberg-Carlson Surplus Well Over a Million Dollars.

The profit and loss statement of the Stromberg-Carlson Telephone Mfg. Co., for the year ended December 31, 1921, which is shown on this page together with the balance sheet, indicates a surplus of over $1,400,000. Three dividends of 4 per cent each and one of 2 per cent were paid during the year.

The certificate of the auditors states that the valuation of the inventories of stocks on hand has been made at prices not exceeding cost or market, whichever was the lower; that full provision has been made for depreciation, and that an adequate reserve is maintained for possible market fluctuations.

ASSETS.

Fixed assets:		
Machinery, factory equipment, tools, etc., less reserves		$ 332,658
Current assets:		
Raw materials, supplies, work in process and finished product		1,138,011
Accounts receivable, less reserve		532,560
Notes receivable		272,061
United States liberty bonds and Canadian government bonds (market value $429,000)		407,198
Cash on hand and in banks		90,356
		2,440,186
Deferred charges		18,614
		$2,791,458

LIABILITIES.

Capital stock:		
Authorized	$1,000,000	
Issued	845,000	
Less held in company's treasury	10,450	
		$ 834,550
Current liabilities:		
Notes given banks		$ 50,000
Accounts payable, including accrued wages and taxes		110,244
Advances by customers on contracts		30,080
Provision for excess profits and income taxes		76,000
		$ 266,324
Reserves:		
For contingencies		$ 50,000
For market fluctuations in inventory values		200,000
		250,000
Surplus		1,440,584
		$2,791,458

PROFIT AND LOSS AND SURPLUS ACCOUNT.

Surplus at Dec. 31, 1920		$1,235,238
Net income for the year, after deducting depreciation, but before interest and federal taxes	$414,945	
Deduct interest paid	16,762	
	$398,183	
Deduct provision for excess profits and income taxes	76,000	
Net profit for the year 1921		322,183
		$1,557,421
Deduct dividends paid: Four per cent March 10, 1921; 4 per cent June 10, 1921; 4 per cent Sept. 10, 1921; 2 per cent Dec. 10, 1921		116,837
Surplus at Dec. 31, 1921, per balance sheet		$1,440,584

Wireless Telephone Service Between Two Cities in China.

A wireless telephonic service was opened between Peking and Tientsin on March 7. It is claimed to be the longest line in the world open to public use.

The system as perfected in the Peking-Tientsin service ensures transmission when connected with telephone central offices. The tests that were applied at the opening ceremony were entirely successful. The distance between Peking and Tientsin is 80 miles.

Switzerland Loud-Speaking Wireless with London.

A loud-speaking wireless telephone installation has recently been completed at Lausanne, Switzerland, which will be in communication with the Eiffel Tower telephone in Paris between five and six in the evening. It will be able to record communication from London, Berlin, and even America, while aeroplanes on the London-Paris-Lausanne services can maintain constant communication with it.

HELP WANTED

WANTED—Cableman. Submit references with reply. Address Peninsular Telephone Company, Tampa, Florida.

POSITION WANTED

POSITION WANTED—By first-class all-around telephone man, as manager, plant man, or combination of both, of magneto system. Twenty years' experience in all branches. Best references. Address 4921, care of TELEPHONY.